

PRS-TTP-91-002

APRIL 1991

Foreign
Broadcast
Information
Service



A N N I V E R S A R Y
1941 - 1991

JPRS Report—

Telecommunications

DISTRIBUTION STATEMENT A

Approved for public release;
Distribution Unlimited

19980506 008

DTIC QUALITY INSPECTED

REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL INFORMATION SERVICE
SPRINGFIELD, VA. 22161

Telecommunications

JPRS-TTP-91-002

CONTENTS

1 April 1991

INTERNATIONAL

| | |
|--|---|
| BBC To Beam Medium-Wave to Southern Africa [Johannesburg SAPA] | 1 |
| Japanese Sign Contract With Kenya Broadcasting [Nairobi KNA] | 1 |

SUB-SAHARAN AFRICA

INTER-AFRICAN

| | |
|--|---|
| SADCC Report Notes Regional Progress [Gaborone Domestic Service] | 2 |
| Study Designates Abuja as Likely Telecom 'Hub' [Lagos THE GUARDIAN 22 Dec] | 2 |

KENYA

| | |
|--|---|
| Government Updates Telecommunications Network [Chichester INTERNATIONAL TELECOMMUNICATIONS INTELLIGENCE 22 Oct] | 3 |
|--|---|

NIGERIA

| | |
|---|---|
| World Bank To Finance Network Expansion [THE GUARDIAN 10 Dec] | 3 |
|---|---|

SOUTH AFRICA

| | |
|--|---|
| Contract Signed for Undersea Fiber-Optic Cable [Johannesburg Domestic Service] | 4 |
|--|---|

TANZANIA

| | |
|---|---|
| National, Commercial Services on Broadcast Times [Dar es Salaam Domestic Service] | 4 |
|---|---|

ZIMBABWE

| | |
|---|---|
| Telephone Network Expansion Projects Listed [THE HERALD 10 Dec] | 4 |
|---|---|

CHINA

| | |
|---|---|
| Developments in Fiber-Optic Communications | 6 |
| Optical Equipment Accredited [DIANXIN JISHU Dec] | 6 |
| Shanghai-Nanjing Trunkline To Be Built [ZHONGGUO DIANZI BAO 11 Dec] | 6 |
| Cable-Core Filling Oil Passes Appraisal [JIANGSU KEJI BAO 12 Dec] | 6 |
| First Domestic Undersea Cable Laid [KEJI RIBAO 13 Dec] | 6 |
| Beijing-Baoding Railroad's Special System [ZHONGGUO DIANZI BAO 18 Dec] | 6 |
| Digital Fiber-Optic Test Equipment Developed [KEJI RIBAO 27 Dec] | 6 |
| Beijing-Shanghai Digital Microwave Line [XINHUA] | 7 |
| Jilin Communications Capabilities Reported [Changchun Jilin Provincial Service] | 7 |
| Shanghai Broadcasting To Have Highest Tower [XINHUA] | 7 |
| Shandong Builds More Telecommunications Systems [Jinan Shandong Provincial Service] | 7 |
| Liaoning Reports More Microwave Lines [Shenyang Liaoning Provincial Service] | 7 |

EAST ASIA

AUSTRALIA

| | |
|---|---|
| International Telecommunications Activity Reviewed [Chichester INTERNATIONAL TELECOMMUNICATIONS INTELLIGENCE 22 Oct] | 8 |
|---|---|

BURMA

Satellite Ground Station Inaugurated in Myawadi [Rangoon Domestic Service] 8

HONG KONG

Asian No.2 Comsat Set for Launch in April [Beijing BEIJING REVIEW 7-13 Jan] 9

LAOS

New Soviet-Aided Transmitter-Receiver Station [KPL] 9

VIETNAM

Television Expands to Central, Southern Areas [Hanoi Domestic Service] 9

EAST EUROPE

HUNGARY

Telecommunications: Pros, Cons of Monopoly Argued [MAGYAR NEMZET 20 Nov] 10

CZECHOSLOVAKIA

Czech-German Joint Venture in Telecommunications
[Chichester INTERNATIONAL TELECOMMUNICATIONS INTELLIGENCE 15 Oct] 12

POLAND

Media Chief Outlines Radio-Committee Plan [PAP 8 Jan] 12

New Radio, Television Chief on Television Plans [RZECZPOSPOLITA 9 Jan] 12

Radio, TV Broadcasting Applications Increase [GAZETA WYBORCZA 20 Mar] 12

Financing Telecommunications Modernization [RZECZPOSPOLITA 11 Feb] 13

Polish Radio Programming Changes Outlined [Warsaw TV] 14

ROMANIA

Romania To Expand Telephone System [Brussels EUROPE 12 Dec] 14

YUGOSLAVIA

Travnik Begins Experimental TV Broadcasts [TANJUG] 14

LATIN AMERICA

ARGENTINA

National Telecommunications Reviewed [Maidenhead TELEFACTS Nov] 15

BRAZIL

German Satellite Found in Paraiba State Waters [FOLHA DE SAO PAULO 23 Dec] 18

CHILE

National Telecommunications Reviewed [Maidenhead TELEFACTS Nov] 18

NICARAGUA

New Television Channel Slated for April [Managua Television] 22

1 April 1991

NOTICE TO READERS

FBIS is in the process of assessing the usefulness of the *JPRS Telecommunications Report* and needs your assistance. Please respond to the following questions so we can update our consumer lists and validate your requirements for this report.

1. When was the last time you used Report material in your work?
 - a. Within the past month.
 - b. 1-6 months ago.
 - c. Over 6 months ago.

2. How important is the Report to your work?
 - a. Vitally important.
 - b. Very important.
 - c. Somewhat important.
 - d. Unimportant.

3. How often have you found items in the Report which were not available anywhere else?
 - a. Very often.
 - b. Often.
 - c. Sometimes.
 - d. Seldom.
 - e. Never

4. Are Report items sufficiently timely for your purposes?
 - a. Yes
 - b. No

5. Would you like to continue receiving the Report?
 - a. Yes
 - b. No

6. Are you interested in receiving a soft copy version of the Report?
 - a. Yes
 - b. No

Additional Comments: (Use separate sheet if necessary)

7. Please update your mailing address if necessary (or just tape on the mailing label from the envelope in which you received this):

Name/Title _____

Office: _____

Address: _____

Please return to: FBIS/ED (Attn TTP Coordinator) or (internally)
P.O. Box 2604 FBIS/ED
Washington, D.C. 20013 Rm. 1s29
RCC-B

BBC To Beam Medium-Wave to Southern Africa

*MB1201055691 Johannesburg SAPA in English
0402 GMT 12 Jan 91*

[Text] London Jan 11 SAPA [dateline as received]—The British Broadcasting Corporation's World Service broadcasts will be transmitted on medium wave to southern African listeners from February 1, bringing to an end years of scratchy and often difficult to locate short-wave transmissions.

A spokesman for the BBC World Service said in London on Friday [11 January] that test transmission on the medium wave transmitter in Lesotho were starting this month and the service would be fully operational from February 1 on 1197kHz.

While enjoying growing listenerships elsewhere in the world, the BBC has traditionally battled to secure an audience in southern Africa, and the World Service hopes medium wave transmissions, which are much easier to tune into, will prove a breakthrough.

To mark the launch of the new service, a series of special programmes for and about South Africa will be broadcast in February and March.

The spokesman said BBC World Service and BBC African Service producers and reporters were travelling throughout the Republic this month to gather material for their special radio programmes.

Japanese Sign Contract With Kenya Broadcasting

*EA1501195491 Nairobi KNA in English 1421 GMT
14 Jan 91*

[Excerpt] Nairobi, 14 January (KNA)—Kenya Broadcasting Corporation [KBC] this morning signed a contract with Marubeni Corp. of Japan for the implementation of the KBC radio modernisation project. The signing ceremony was held in Tokyo, Japan. KBC managing director, Mr. David K. Ole Nasieku, signed for the corporation. The ceremony was witnessed by the permanent secretary for information and broadcasting, Mr. Joash Adamba, and the chairman of the KBC, Dr. Julius Kiano.

Through this contract, Marubeni Corp., will construct, equip and commission five new radio transmitting stations [words indistinct] Maralal, Wajir, Marsabit and Malindi. The Japanese firm will also upgrade five existing stations at Ngong in Nairobi, Nyamninya (Yala), Marania (Meru), Voi and Garissa. This turn-key project will cost some 2,400 million Kenyan shillings and, when completed, it is expected to boost the current radio reception to over 80 percent of nearly 90 percent of the population. The funds for this project were provided by the Government of Japan through its financing arm of Overseas Economic Co-operation Fund (OECF). [passage omitted]

INTER-AFRICAN

SADCC Report Notes Regional Progress

*MB0101091691 Gaborone Domestic Service in English
1910 GMT 31 Dec 90*

[Text] The South African Transport Communications Commission, SATCC, program of telecommunications project is reported to have constantly grown over the years, and the total cost may exceed 1.6 billion pula.

A report to be presented to the SADCC [Southern African Development Coordination Conference] annual consumer [word indistinct] conference in Windhoek next month says that with the exception of project elements in Mozambique and Angola, not much further growth is anticipated as the capital investment program has been well established for the provision of the backbone regional telecommunications infrastructure for the next 10 years.

According to the report the SADCC countries have a capacity of approximately 400,000 direct exchange lines, with connected telephones having an average regional penetration factor of only 0.3 telephones per 100 inhabitants.

The report says the program is aimed at extending the telecommunications services in support of regional transport corridors, economic and trade facilitation. It says important digital international telephone switching centers with international subscriber dialing, ISD, facilities in Swaziland and Mozambique, and the Panafotel [Pan-African Telecommunications Network] microwave links interconnecting Malawi, Zimbabwe, and Mozambique, have been commissioned during the past year.

The report states that Tanzania and Angola are yet to implement and commission the detailed gateway exchanges with ISD facilities for automatic access to the regional network.

It says the main activities in telecommunication have been operational coordination and training to increase the flow of traffic, improving efficiency of utilization and availability of links in preparation for the reorientation of regional earth stations to face the common 335.3 Intelsat satellite for regional interconnections.

Study Designates Abuja as Likely Telecom 'Hub'

*91WT0099A Lagos THE GUARDIAN in English
22 Dec 90 pp 1, 2*

[Unattributed article: "Abuja May House Africa's Telecom Centre"]

[Text] A plan to make Nigeria the nodal point of Africa's future telecommunications network may be adopted at the region's Communications Ministers meeting scheduled for next month in Abuja.

Under the plan, all the telecommunication transmission paths from one African country to the other will transit through Nigeria, presumably Abuja.

This will end the present situation where such paths make tortuous and expensive journeys through Europe before finally returning to Africa.

The African network, which will have its "hub" in Nigeria, will provide for both satellite, optical, microwave and digital transmission.

Eventually, the arrangement is expected to provide answers to an envisaged single European telecommunications market and also ensure the standardisation and sourcing of future telecommunication systems from a common market with answers to the tropical climate.

The blueprint spelling out details of the arrangement and its execution processes will be based on the study of the Inter-Agency Coordinating Committee (IACC) of the Regional African Satellite Communication System for development of Africa (RASCOM).

The RASCOM study, while identifying the satellite communications needs and proposals for services to satisfy the requirements, will:

- undertake technical and economic studies for the design, launching and operation of a regional dedicated satellite system to provide an efficient and economical system;
- integrate the space component into the existing or planned network and the preparation of specifications for the design of all equipment that may be required for the integrated regional system, considering Africa's economic, social and physical environment.

The \$7.5 million (about 60 million naira) study is being financed with contributions from the African Development Bank (ADB), United Nations Development Programme (UNDP) and the ITU.

Other donors are the United Nations Educational Scientific Cultural Organisation (UNESCO), the Organisation of African Unity (OAU), Italy and the Federal Republic of Germany.

In compiling the study, the telecommunications requirements of the maritime, civil aviation, meteorology sector, News Agency of Nigeria (NAN), petroleum industry and Nigeria Railways will be considered.

High priority will be accorded telecommunications requirements of rural areas of Africa and several rural networks are currently being set up for arriving at relevant network's engineering guidelines.

Already Telecommunications Consultants of India Limited (TCIL) and the European Satellite Consulting Organisation (ESCO) are providing consultancy services on the study.

NEAR EAST & SOUTH ASIA

INTERNATIONAL

Libya, Sudan Sign Media Cooperation Agreement [Tripoli JANA] 23

INDIA

'Leap in Communications Technology' for Army [THE TELEGRAPH 12 Feb] 23
Need for Reorganization of Telecommunications [THE HINDU 19 Feb] 23
Handling of Satellite Communications Questioned [THE HINDU 12 Jan] 25
Progress in Fiber-Optics Communications [THE HINDU 23 Jan] 26
Problems With Foreign Technology Feared [THE HINDU 10 Jan] 27
World Bank 'Preliminary Study' Summarized [THE HINDU 22 Jan] 28

SRI LANKA

Government To Upgrade Telecoms Services
[Chichester INTERNATIONAL TELECOMMUNICATIONS INTELLIGENCE 19 Nov] 29

SOVIET UNION

Mobile Phone Net Test in Estonia [Helsinki HELSINGIN SANOMAT 9 Jan] 30
Estonian Radio Director Protests 'Jamming' Claim [Moscow Domestic Service] 30
Kazakhstan Launches Satellite TV Broadcasts [KRASNAYA ZVEZDA 9 Jan] 30
Pro-Soviet 'Underground' Radio Operating in Baltics [Vilnius International Service] 30

WEST EUROPE

EUROPEAN AFFAIRS

Europesat Ratified; Satellites To Be Built [Paris ELECTRONIQUE HEBDO 10 Jan] 32
EC Reexamining Telecommunications Monopoly [Vienna DIE PRESSE 23 Jan] 32

CANADA

Telesat Mobile Signs Deal To Buy Satellite [THE TORONTO STAR 20 Dec] 33

FRANCE

European Space Agency Affected by Budget Cuts [LE QUOTIDIEN DE PARIS 2-3 Mar] 34

GERMANY

North Rhine-Westphalia Promotes Teletech NRW [HANDELSBLATT 4 Jan] 34

ITALY

Telecommunications Developments Reported 35
Research Project [ITALIA OGGI 30 Oct] 35
High Definition Television [ITALIA OGGI 30 Oct] 36
Telecom Satellite Launch Preparations Described [AIR PRESS 12 Dec] 37

PORTUGAL

1991 Satellite Launching Studied [EXPRESSO 23 Feb] 38

UNITED KINGDOM

Satellite Research Center Opens in Surrey [THE DAILY TELEGRAPH 2 Feb] 39

The state of telecommunication in Africa is being reviewed and development targets will be set up over a given period to support their medium and long-term economic and social development programmes.

Efforts are also being taken to determine the different types of equipment required for the realisation of the African plan "thereby permitting the pooling of requirements for common purchasing that will not only lead to great savings but will also encourage the industry to design equipment that suits the African environment.

The RASCOM objectives are believed to be necessary panacea for the ills of telecommunications development in the region.

Apart from finding appropriate solutions to low telephone penetration problems and equipment proliferation, the current regional moves may strip it from the grip of European networks.

The African telephones density of 0.4 to 100 inhabitants as against 5.3 for Asia, 4.0 for South Africa, 29.5 for Europe and 73 for the United States has been a worrisome problem.

Telecommunications systems proliferations which had caused interfacing and interconnectivity aches within African networks may be eliminated.

Observers believe that with developments in unified Europe, the traditional African telecommunication market—which tend towards the harmonisation of tariffs, making cost of telecommunication more or less uniform throughout the community may be advantageous to the current thrust of African network development.

KENYA

Government Updates Telecommunications Network

91AN0098A Chichester INTERNATIONAL TELECOMMUNICATIONS INTELLIGENCE in English 22 Oct 90 p 17

[Text] The UK company GPT has had further success in obtaining business from the Kenyan Posts and Telecommunications Corporation (KPTC).

Firstly, the company has received a contract, worth more than 1.1 million pounds, to provide a 565-Mbit/s optical fibre system capable of handling 7,680 simultaneous telephone or data calls, as well as equipment for 140-Mbit/s and 2-Mbit/s line systems. The route will extend from Nairobi to Kenya's national External Telecommunications Network. This is believed to be the first 565-Mbit system to be installed in Africa.

Delivery and installation of the equipment is expected to start at the end of this year. The transmission routes further the development of Kenya's infrastructure into the suburban areas of the country's two largest cities—

Nairobi and Mombasa. These two major trunk sites will now be connected to Kenya's various digital satellite exchanges.

The optical fibre cable for the links will be provided by GPT Telephone Cables Ltd and the line systems will be manufactured at the Network Systems Group's sites in Coventry and Beeston, Nottingham.

Secondly, GPT has established a trial solar-powered radio pay phone link at KPTC's Public Telephone Services headquarters in Nairobi. The equipment has been set up to demonstrate how pay phone facilities can be provided to rural communications and remote areas which are not cabled to a telephone exchange.

The equipment consists of a complete rural pay phone system transmitting over a short VHF radio link to the exchange terminal. According to GPT, the pay phones being used are consistent with those being marketed worldwide for conventional applications and are operated using prepaid cards. The pay phone is housed in a prototype booth and is powered from two small solar panels mounted on a mast structure. The mast also contains a yagi antenna which provides the radio transmission path.

The solar powered radio pay phone trial is part of GPT's recently announced 10-year programme to provide and locally manufacture prepay card pay phones for installation throughout the country's urban and rural areas. This pay phone manufacturing announcement also included news of a contract to install a microwave network which will link with the Nairobi-Mombasa microwave system already being installed by GPT. GPT has also previously received contracts to supply a range of GPT switching, transmission, and terminal products.

NIGERIA

World Bank To Finance Network Expansion

91WT0072A Lagos THE GUARDIAN in English 10 Dec 90 p 28

[Article by communications correspondent Aaron Ukodie]

[Text] Not less than N881 million will be injected into the Lagos telecommunication network to boost its performance capabilities preparatory to its expansion programme to be financed by World Bank's (U.S.\$250 million) N1.85 billion loan.

The Lagos network performance project, which is billed to start in January with a completion period of nine months, will be financed by internally generated revenue and part of Siemens DM 500 million loan package.

More lines would ultimately be introduced through the project while congestion problems and delay dialling tones, a disturbing feature of the Lagos telecommunications network, is expected to be a thing of the past.

SUB-SAHARAN AFRICA

JPRS-TTP-91-002
1 April 1991

This is besides the World Bank Lagos network rehabilitation programme billed to provide a permanent solution to "all ills" of the network, most especially the introduction of adequate lines to match surging demand.

A German company ELTEC/Siemens (Nig.) Limited has been given the go ahead to execute the major part of the job, which will involve the introduction of primary switching centres and local exchanges into the Lagos network.

It is expected that eight mobile exchanges, six in Lagos and one each in Port Harcourt and Nnewi, will also form part of the package at a cost of N243 million.

An optical fibre cable ring to replace the conventional cable will be woven around the Lagos network at a cost of N187.5 million to provide better signal transmission capabilities.

The mobile exchanges and the optic/fibre cable network are envisaged to alleviate the telecommunications problems that exist in the Lagos network preparatory to the permanent solution built into the World Bank arrangement.

The digital toll and local exchanges expected to gulp N450 million is aimed at solving network inter-facing and incompatibility problem that was likely to arise from the completion of the digital link from Abuja to Lagos.

The completion of the project will also make it possible for the Abuja to Lagos digital link to be put into use.

Competent sources told THE GUARDIAN that the Nigerian Telecommunications Limited (NITEL) was losing "a minimum of N3 million daily through the nonuse of the Abuja-Lagos link.

Meanwhile, it was learnt at the weekend that NITEL was considering making it possible for Lagos residents to subscribe to part of the 20,000 digital telephone lines recently commissioned through in-built "engineering process."

SOUTH AFRICA

Contract Signed for Undersea Fiber-Optic Cable

*MB0401133391 Johannesburg Domestic Service
in English 1100 GMT 4 Jan 91*

[For earlier report, see JPRS-TTP-90-015, 2 November 1990, p 2]

[Text] A contract has been signed in Pretoria for a new optical fiber telecommunications cable from South Africa to the Canary Islands and Madeira.

The 9,500 km cable, which will be commissioned by May 1993, will have 7,680 channels, and will cost 750 million rands.

Thirteen telecommunication enterprises from 12 countries will have an interest in the cable, which will be connected to other optical fiber cable systems to form an international network.

The cable, which will run into the sea at Melkbosstrand on the Cape [Province] west coast, will probably meet South Africa's telecommunication needs until 2020.

TANZANIA

National, Commercial Services on Broadcast Times

*EA0601180491 Dar es Salaam Domestic Service
in Swahili 1700 GMT 4 Jan 91*

[Text] Dar es Salaam—Radio Tanzania, Dar es Salaam, will resume broadcasting its national commercial services on 6 January. Announcing the decision today, broadcasting Director Comrade David Wakati said the work of assembling two new 100-kw transmitters was now complete. He said that when the broadcasts begin on 6 January Radio Tanzania will be heard at 0500 [0200 GMT] with different programs including commercial programs until 0730. Comrade Wakati said after that the national service would continue with its broadcasts until midnight. He said the commercial service would broadcast between noon and midnight.

The director of broadcasting said the national service will be heard on 837 kHz in the medium-wave band, on 5050 and 4785 kHz in the 60-meter band, and later on the 31-meter band after technical repairs have been completed. Comrade Wakati said the commercial service will be heard on 657 kHz in the medium-wave band and 6105 kHz in the 49-meter band. The director of broadcasting called on commercial advertisers to hurry up and get in touch with Radio Tanzania's offices outside Dar es Salaam since commercial broadcasts are likely to be heard clearly throughout the country. The two services were merged in April 1989 due to a breakdown of national service equipment.

ZIMBABWE

Telephone Network Expansion Projects Listed

*91WT0079C Harare THE HERALD in English
10 Dec 90 p 1*

[Text] Zimbabwe's telephone network has been experiencing a negative growth rate and the PTC [Posts and Telecommunications Corporation] hopes to rectify the situation with the introduction of new digitalised networks.

The senior deputy postmaster-general, Cde Mazwi Dandato, said yesterday that growth had not been able to cope because of the increased demand for telecommunications.

The PTC, he said, was carrying out digitalisation work on Harare, Mashonaland Central, Manicaland and Masvingo province telecommunications networks.

If funds were available, the PTC would augment its transmission trunk network to cope with new exchanges. Plans were under way to improve Midlands and Matabeleland exchanges.

He said a second telecommunications satellite dish was being planned for the Mazowe site.

The present dish, which was oriented towards the Atlantic Ocean Intelsat satellite, could not cater for traffic to the East. A second station would therefore have to be built to cater for the increasing demand for communication to the East.

At present, all communications to the East would have to go through a third country such as England or Italy, a costly procedure because the traffic centres would have to be paid for in hard currency.

Under the new five-year national development plan, all growth points would be covered with telecommunications links.

Developments in Fiber-Optic Communications**Optical Equipment Accredited**

91P60074A Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 12, Dec 90 p 45

[Article by Yu Mou [1342 6180] and Jiang Shui [3068 3055]]

[Text] Sixteen kinds of DS4 [140 Mbit/s, 1,920 voice circuits] optical-terminal special-purpose modules, jointly developed by MPT's Chongqing Communications Equipment Plant and MMEI's Research Institute 13, passed the technical appraisal sponsored by the State S&T Commission in Shijiazhuang City at the end of August. DS4 optical terminals are a national Torch Plan item. It is estimated that construction of the modularized DS4 optical terminals at the Chongqing Communications Equipment Plant will be completed by year's end [1990], and that the units will be on the market next year [1991].

Shanghai-Nanjing Trunkline To Be Built

91P60074B Beijing ZHONGGUO DIANZI BAO [CHINA ELECTRONICS NEWS] in Chinese 11 Dec 90 p 1

[Article by Jiang You [3068 1429]: "Shanghai-Nanjing Fiber-Optic Cable Communications Trunkline To Be Built"]

[Summary] During the Eighth Five-Year Plan, China will construct a 402-km-long Shanghai-Nanjing fiber-optic-cable communications trunkline. The project design passed technical appraisal on 12 November and laying of the line will begin in early 1991. Completion of first-phase construction will mean the opening up of 15,000 new long-distance lines. It is understood that this project is a continuation of the about-to-be-completed Nanjing-Wuhan line.

Cable-Core Filling Oil Passes Appraisal

91P60074C Nanjing JIANGSU KEJI BAO in Chinese 12 Dec 90 p 1

[Article by Xiao Dongquan [5135 2767 0356]: "Opening Up Fiber-Optic-Cable Communications"]

[Summary] The fiber-optic-cable cable-core filling oil developed by the Taihu Communications Materials Plant in Wuxi County passed the expert technical appraisal sponsored recently by the State Education Commission and is now in batch production. This high-tech product, meeting late-eighties international standards, is designed for protecting undersea and deeply buried fiber-optic cables and was developed with the aid of the East China Chemical Institute, the Shanghai Cable Plant, and other institutions.

First Domestic Undersea Cable Laid

91P60074D Beijing KEJI RIBAO [SCIENCE AND TECHNOLOGY DAILY] in Chinese 13 Dec 90 p 2

[Article by Jin Congan [6855 1783 1344] and Chen Jingnong [7115 2417 6593]: "Laying of China's First Undersea Fiber-Optic Cable Completed"]

[Summary] Laying of China's first functional undersea fiber-optic cable, jointly developed by MMEI's Huainan Research Institute 8 and Hubei Province's Hongqi Cable Plant, was officially completed on 18 November at Qingdao. This 33-km-long, four-core single-mode fiber-optic cable has a 1.3-micron operating wavelength, an average transmission loss of 0.377 dB/km, and a maximum transmission loss of 0.46 dB/km. Under a tension of 15 tons, elongation of this steel-wire-reinforced cable is only 0.35 percent.

Beijing-Baoding Railroad's Special System

91P60074E Beijing ZHONGGUO DIANZI BAO [CHINA ELECTRONICS NEWS] in Chinese 18 Dec 90 p 1

[Article by Ge Xiuhan [5514 0208 3466]: "Railroad-Use DS3 Fiber-Optic Communications System Passes Appraisal"]

[Summary] The Beijing-Baoding Railroad DS3 [34 Mbit/s, 480 voice circuits] fiber-optic communications system, developed by the Nanjing Wired Telecommunications Plant, passed MMEI-sponsored technical appraisal in Nanjing on 6 December. This 154-km-long system for providing long-haul communications to railroad authorities includes advanced equipment such as microcomputer monitoring stations.

Digital Fiber-Optic Test Equipment Developed

91P60089A Beijing KEJI RIBAO [SCIENCE AND TECHNOLOGY DAILY] in Chinese 27 Dec 90 p 1

[Article by Ji Hongguang [1323 3163 0342]: "China's Digital Communications Testing Technology Enters World's Advanced Ranks"]

[Summary] Beijing, 26 Dec—During the Eighth Five-Year Plan [1991-95], China will construct a nearly 70,000-kilometer-long digital fiber-optic communications network, in which about 20 percent of engineering investment will go toward transmission test instruments, heretofore manufactured only by three nations in the world—the U.S., Japan, and Germany. Faced with the problem of continuing outlays of foreign exchange for importation of such instruments, MPT in 1986 undertook a major Seventh Five-Year Plan project to utilize the nation's own resources toward development of these instruments, a project which has now been completed.

The instruments which have just passed technical appraisal include a digital transmission system analyzer for DS1-DS4 [DS1 = 2Mbps, 30 voice circuits; DS2 =

8Mbps, 120 voice circuits; DS3 = 34Mbps, 480 voice circuits; DS4 = 140Mbps, 1920 voice circuits] systems, a DS4 phase jitter analyzer, and a DS5 [565Mbps] (7680 voice circuits) bit-error-rate analyzer. The MPT unit responsible for development of these instruments is the Beijing Instruments & Meters Research Institute, which not only produced the sample instruments, but also put them into batch production. Experts at the technical appraisal commented that the nation's digital fiber-optic communications testing technology now stands in the world's front ranks, and that the appearance of these domestically made instruments will provide a major boost to China's development of DS5 systems, as well as save the state major outlays of foreign exchange.

Beijing-Shanghai Digital Microwave Line

*OW1801105291 Beijing XINHUA in English
1038 GMT 18 Jan 91*

[Text] Nanjing, January 18 (XINHUA)—China's longest digital micro-wave telecommunications trunk line between Beijing and Shanghai has been completed.

The line, which is expected to upgrade communications capacity by 60 percent, passed a state technical appraisal conducted today at Wuxi City, Jiangsu Province.

Experts say the digital trunk line allows simultaneous transmissions on 3,840 lines. The transmissions can be in many forms including long-distance calls, video images, digital telegrams, and facsimile messages. The system also makes it easier for computer networking.

The 1,718.6 trunk line passes through Hebei, Tianjin, Shandong, Anhui and Jiangsu Provinces.

The cost of the project was over 130 million yuan, and major equipment was imported from Japan and Italy.

Jilin Communications Capabilities Reported

*SK1701075591 Changchun Jilin Provincial Service
in Mandarin 1030 GMT 16 Jan 91*

[Summary] During the Seventh Five-Year Plan period, Jilin Province has scored rapid progress in building post and telecommunications facilities. The province's capacity of telephone exchanges has reached 288,000 lines, a 173,000 line increase over 1985 and a 43.2 percent increase over the period of the Sixth Five-Year Plan. The province's volume of autonomous telephone system has reached 4,300 lines, a 4,006 line or 10-fold increase over 1985; and that of long-distance telephone system has reached 4,415 lines, a 2,129 line or 1.6-fold increase over 1985. During the period, the province has newly established 110,000 program-controlled autonomous telephone exchanges. At present, the long-distance telephone systems of 76-percent cities and counties in the province have been fed into the national autonomous telephone network. The province's 227 townships and towns have set up autonomous telephone exchanges.

Shanghai Broadcasting To Have Highest Tower

*OW2612191390 Beijing XINHUA in English
1639 GMT 26 Dec 90*

[Text] Beijing, December 26 (XINHUA)—The Shanghai Broadcasting and Television Development Corporation has decided to build a 450-meter TV tower in the Lujiazui District of the Pudong Area in Shanghai Municipality, according to today's ECONOMIC REFERENCE newspaper.

The tower will be the highest of its kind in Asia and the third highest in the world. The total investment in the tower will be around 200 million yuan (nearly 40 million U.S. dollars).

Construction of the tower will start in June, 1991 and be completed before the end of 1993.

Two domestic banks in Shanghai have been entrusted to collect funds to be used for the construction of the tower.

Shandong Builds More Telecommunications Systems

*SK1501074191 Jinan Shandong Provincial Service
in Mandarin 2300 GMT 14 Jan 91*

[Summary] In 1990 Shandong Province scored marked achievements in building microwave telecommunications systems. By the end of 1990, the province put three large digital microwave telecommunications lines which are 1,358 km long and with 47 relaying stations into operation or into trial operation. During the year, the increased length of such telecommunication lines showed a 3.2-fold increase over 1980 and the increased number of relay stations showed a 5.9-fold increase over 1980. The construction of three microwave telecommunications lines, between Beijing Municipality and Shanghai Municipality through Shandong Province, between Jinan City and Qingdao City through Linyi City, and between Yantai City and Zhaoyuan County through Weihai City, is sponsored by the State Council and the provincial People's Government by importing the advanced microwave telecommunications equipment from Japan and West Germany with the loan offered by West Germany and uses both imported and domestic equipment. Each line contains three main channels and each of the channels contains 1,920 lines. At present, the province has formed a microwave telecommunications network with the center in Jinan City which is connected to most localities across the province and with all coastal cities.

Liaoning Reports More Microwave Lines

*SK1401045191 Shenyang Liaoning Provincial Service
in Mandarin 1030 GMT 11 Jan 91*

[Summary] During the Seventh Five-Year Plan period, our province's trunk microwave communication lines increased to more than 1,400 km, amounting to 48 percent of all the long-distance communications lines. A microwave communications network centering on Shenyang and extending in all directions has taken shape in our province.

EAST ASIA**AUSTRALIA****International Telecommunications Activity Reviewed**

91AN0099A Chichester INTERNATIONAL TELECOMMUNICATIONS INTELLIGENCE in English 22 Oct 90 pp 18-19

[Text] OTC Limited, Australia's international telecommunications operator which is to be merged with the country's domestic telecommunications operator—Telecom Australia—following the government's decision to restructure the industry in order to introduce competition within the sector, reported total group operating revenues of 1,517.2 million Australian dollars (A\$) for the year ended 31 March 1990, which was 18.5 percent above the A\$1,280 million reported a year earlier. Operating profits increased 30.8 percent to A\$385.5 million, while net profits rose by A\$45.5 million to A\$234.6 million.

Investment in research and development totalled A\$10.7 million in fiscal 1989/90, compared with A\$8.2 million in 1988/89. A\$18 million has been budgeted for 1990/91.

OTC Limited's first annual report to be published (on 1 April 1989 the Overseas Telecommunications Commission was converted to a public company under the name OTC Limited) reveals that the volume of telephone traffic, incoming and outgoing, increased by 24.4 percent over the previous year and transit telephone traffic volume increased by 76.3 percent. OTC provides telecommunications services to 219 destinations in 185 countries. Approximately 60 percent of the company's traffic is carried on the Intelsat satellite system; the remaining 40 percent of international traffic into and out of Australia is carried on submarine cable systems.

OTC International, the company's wholly-owned offshore operations, marketing, and training subsidiary, secured contracts totalling A\$150 million during the year ended 31 March 1990. Vietnam's domestic and international communications facilities have been substantially improved following the completion by OTC International of two major earth stations—one each in Hanoi and Ho Chi Minh City—and in providing ancillary equipment in the Mekong Delta and Ho Chi Minh City. (Subsequently, in September 1990, OTC landed the big one—a A\$250-million contract to assist in the modernisation, expansion, and management of Vietnam's international network for an initial 10-year period.

Other contracts included the signing of a "commercial arrangement" with the Cambodian Directorate of Posts and Telecommunications; the signing of a Memorandum of Understanding (MOU) with the government of Kiribati for the upgrading of the island nation's telecommunications network; the setting up of a high-speed digital satellite data network in Thailand as a result of a joint venture with Samart Telecoms; the signing of a MOU with Syarikat Telekom Malaysia Berhad (STM), which

includes the joint development and provision of business telecommunications and value-added services in the Malaysian market and elsewhere; and the commissioning of a new satellite earth station on the Micronesian island of Nauru.

In March 1990, an agreement was signed to link the island communities in the South Pacific with a state-of-the-art satellite communications system known as the Pacific Area Cooperative Telecommunications (PACT).

With regard to network development, in September 1989, OTC Limited and 31 other international telecommunications carriers and administrations initiated an agreement for the construction of the PacRim submarine fibre-optic cable network. The network, extending some 14,000 km, involves the construction of two cables—PacRim East and PacRim West. Total cost of the PacRim project is estimated to be in the order of A\$800 million, of which just under 50 percent is to be met by OTC, representing the largest single capital investment ever undertaken by the company.

At the end of 1989, OTC signed an agreement with Northern Telecom of Canada for the supply of Australia's first international ISDN exchange. OTC Switched Digital, the first of a range of services that are to be launched based on the international ISDN technology, was introduced earlier this year and currently provides access to Japan, the United States, and the UK. Negotiations are under way to introduce the service to New Zealand, Singapore, and Hong Kong later this year. By the end of 1991 the service is expected to extend to more than 10 countries.

BURMA**Satellite Ground Station Inaugurated in Myawadi**
BK2102085591 Rangoon Domestic Service in Burmese 0630 GMT 21 Feb 91

[Excerpt] An inaugural ceremony to open a satellite ground station and town construction projects was held in Myawadi at 0800 on 12 February.

The ceremony was attended by Colonel Tin Ngwe, deputy commander of the 44th Frontline 44th Light Infantry Division, and military officials; U Saw Wu Lei Du, project engineer of the Myanmar [Burma] Communications Service; U Mahn Ohn Ngwe, manager of the Myanmar Communications Service, and responsible officials; Major Win Kyi, chairman of Myawadi Township Law and Order Restoration Council, and members; departmental officials; public service personnel; and local people. [passage omitted]

HONG KONG

Asian No.2 Comsat Set for Launch in April

*OW0901133491 Beijing BEIJING REVIEW in English
No 1, 7-13 Jan 91 p 30*

[Text] The Asia Satellite Telecommunications Co. Ltd. in Hong Kong, which launched the Asia No.1 comsat in April 1990, is now planning to launch the Asia No.2 comsat. At present, the feasibility and marketing research report on the new satellite has been finished.

The Asia Satellite Telecommunications Co. Ltd. was established by the Hutchison Whampoa Ltd. of Hong Kong, the Cable and Wireless PIC of Britain and the China International Trust and Investment Corp. The corporation's administrative President Xue Dong noted that currently there is greater demand for the capacity of the man-made satellite in Asian areas than that when the Asia No.1 comsat was first designed. With the readjustment of Asian countries' government policies, he said, they are more willing to open their telecommunications business to private investment. Asia's telecommunications industries are expected to follow the path of advanced European and American countries in order to bring about a rapid growth.

The Asia No.2 comsat, like the previous one, will use C frequency channel as telecommunication transmitter. However the capability of the new satellite is greater than that of the Asia No.1 comsat, as its communication area moves lightly to the western part of Asia and extends to East European regions. If bidding is invited in the third quarter of 1991, it is highly likely that the new satellite will be launched in 1994.

Since the Asia No.1 comsat was launched, its 24 relay transmitters have either been leased out or used by clients of the Asia Satellite Telecommunication Co. Ltd.

Presently, 15 relay transmitters are being leased by Hong Kong, Myanmar, Pakistan and Mongolian People's Republic.

LAOS

New Soviet-Aided Transmitter-Receiver Station

*BK0901143091 Vientiane KPL in English 0920 GMT
9 Jan 91*

[Text] Vientiane, Jan 9 (KPL)—The central Savannakhet Province recently reached an agreement with the Soviet authority regarding the reception of Soviet TV programmes through satellite.

This project involving the installation of a TV transmitter-receiver station is the second one which has enjoyed Soviet cooperation. Earlier, northern Luang Prabang Province received a similar system.

The installation of the facilities started in November is expected to be completed this month.

VIETNAM

Television Expands to Central, Southern Areas

*BK2612061090 Hanoi Domestic Service in Vietnamese
0500 GMT 24 Dec 90*

[Text] The Vietnam postal sector is installing a wide-range microwave television broadcasting system to expand television broadcast to the central and southern parts of Vietnam. Technicians are installing an 116-meter antenna for transmitting FM signals and boosting other antenna for the telecommunications sector.

More television transmitters with 10-kw capacity have been added to the VHS and HS system, thereby meeting the standard requirement of the Giang Vo Television Station which operates at a 65-km broadcasting radius.

HUNGARY**Telecommunications: Pros, Cons of Monopoly Argued**

*91CH0193A Budapest MAGYAR NEMZET
in Hungarian 20 Nov 90 p 5*

[Article by Janos Buda: "Installment Payments Are No Problem if the Telecommunications System Is Well-Developed; Everyone Could Have a Phone Within Two Years!"]

[Text] Experts say that the Hungarian economy suffers an annual loss of at least 10 to 15 percent of the national revenues from the low level of development in telecommunications alone. This sum of 120 to 180 billion forints exactly corresponds to the nation's burden of interest and debt payments, i.e., \$2 to \$3 billion. However, this does not include the loss of several billion dollars resulting from the reluctance of (active) foreign capital to enter the country because of such a poor infrastructure. In the Siofok region alone, this loss amounts to a billion dollars. Thus, by adding up the various losses, the country's total losses because of the low development of the telephone network are, by a conservative estimate, at least \$5 to \$6 billion annually.

This sum roughly corresponds to the amount Hungary would need in 1991 for interest and debt payments for changing to dollar accounts because of the CEMA's collapse, and for paying the high oil prices boosted by the Gulf crisis. Evidently then, one of the most important tasks in the economy is to develop telecommunications, together with our public road and railway network.

Arguments for Monopoly

The Hungarian Telecommunications Company (MATAV) will carry out an 83-billion-forint development (at today's prices) during its planned three-year program. A national digital network with half a million new lines will be built. The money for this will come from, among other things, restructured rate schedules (read: great price increases) to be introduced during the first half of 1991, and from loans by the World Bank and the European Investment and Development Bank. The repayment of the latter two is guaranteed by the government.

But there are several concerns about this concept of MATAV, which is also supported by the Ministry of Transportation. First, both MATAV and the ministry admit that this money will only suffice for a small part of the necessary development during these three years. In other words, by the end of this three-year program, the country will continue to suffer a loss of \$5 to \$6 billion a year, and—let us be optimistic—"only" half of that afterwards. Second, in the present state of the program, it is doubtful that it will be realized by the planned deadline and in the desirable quality. Signals are arriving from several Hungarian suppliers that have an interest in this development program that they are unfamiliar with

its concrete details and, consequently, they can consider its requirements in their own production plans only as estimates. This may subsequently cause serious problems. Third, MATAV is a monopolistic state enterprise which is not only guarded against the effects of the market, and consequently, is very inefficient, but is also part of a bureaucratic hierarchy. Therefore, despite the best intentions of the enterprise's new management, there is no guarantee whatsoever for an efficient and unwasteful use of the three-year program's resources.

It is easy to see on the basis of the above, that being content with MATAV's efforts will not serve the country's interests, for millions of dollars are going to be wasted every year for a long time to come. The only feasible way is to break the monopoly that exists in telecommunications, is by allowing those who are offering basic services and others to develop networks and services.

Ministry of Transportation officials and MATAV are against this, however, as it became clear on a recent telecommunications forum for Hungarian experts. Most participants were disappointed because they got what they expected [as published]. This is where the basic principles of the new telecommunications bill were presented. It turned out that the makers of the bill and some experts loyal to the post office want to maintain a monopoly in the basic telecommunications network although they are aware of the country's losses and of MATAV's limited abilities. Although the above would also suffice to demonstrate the untenability of their view, it will be good to see their arguments in support of monopoly.

First argument: Since telecommunications is the world's most secure, most risk-free, and most profitable investment, allowing foreign capital and market competition to enter telecommunications would mean that profits in dollars would be siphoned out of the country.

Second argument: Building several networks and allowing foreigners to enter would lead to wastefulness and technological chaos. It would increase service rates, and would eliminate investment in less profitable or unprofitable areas.

Third argument: By allowing competition and eliminating monopoly, the national control of telecommunications would be lost and the nation would become vulnerable.

Fourth argument: The country does not have enough effective demand to support two or three, or even more telephone companies offering basic network services, and most applicants today would not be able to pay the present investment contribution cost.

Fifth argument: If market competition were allowed, MATAV would be forced to lay off half of its 23,000 workers.

...and Against

There are a series of counterarguments. First, by allowing foreign capital and market competition, the annual national losses of several billion dollars would be eliminated within a year and a half or two years. Ventures are ready to take off, raising telecommunications within a year and a half to a level MATAV promises only for the year 2000. The result would not be siphoning out dollars, but the contrary. The present situation is like a dollar valve which prevents the inflow of billions of dollars into the country. Foreign participation in the Hungarian telecommunications market could be solved through license contracts. At any rate, the profits taken out by investors would only be a fraction of what the country would gain by developing telecommunications. Foreigners might even keep their profits in the country if the government in power can create an investment-friendly environment.

Second, the United States is a good example for showing that several networks and market competition do not lead to technological chaos, nor to wastefulness, nor to price increases. On the contrary, stiff competition is one of the important forces ensuring efficient management, and quality service for the consumer, and lower prices. The compatibility of [network] systems is also in the operators' interest. It is still unclear which one of the digital networks has a future. Since we do not have the time to wait in order to find out, it is better to allow them to settle here—at their own risk. It may be included in the license contracts that entrepreneurs must develop telephone networks in unprofitable areas as well.

Third, allowing market competition and the use of foreign capital will not result in losing national control over telecommunications. On the one hand, the amount of foreign share can be specified. It is not certain that this must be a maximum of 49 percent. On the other hand, there are companies in Hungary, including some with strong capital, which were forced to build their own national telephone networks because of the backward postal network as well as factory safety considerations. These systems are still not used to full capacity. It should be made possible for these companies to further develop these networks with the help of foreign capital and Hungarian private investors and to use them for offering telephone services to anyone. National control and consumer protection can be achieved through other means and, again, the United States is a good example. Since investment in telecommunications is guaranteed to be risk-free, the maximum rate of profit can be set and excess profits can be appropriated. In the event of certain consumer complaints, the service company could be banned for a certain time period from any price increase, and so forth. Those who do not subscribe to these conditions will not build a network here. It is today, rather, that the country is vulnerable because there are not enough telephones, and it is up to a government authority and a company with a monopoly to determine, on the basis of certain debatable criteria,

who may or may not have a telephone. In addition, this situation offers excellent opportunities for abuse.

Fourth, let that certain effective demand determine how many service companies it wants to support. As long as there are not enough telephones, no one can state with certainty how many networks the country can sustain. If these networks are built, not with public, but with private monies, the state and the country are not risking a single penny by allowing competition. The investors will figure out anyway to which extent it is worth it to them to enter the Hungarian market. Similarly, the size of the effective demand cannot be determined from the estimate of how many people would be able to pay the 10,000-to-20,000-forint investment contribution. This is not where profits in telecommunications come from; they come instead from its use by as large a number of people—and as frequently—as possible. It is conceivable that, in case of competition, when the goal of the entrepreneurs is to attract as many customers as possible, they would be willing to install telephones to customers even for a fraction of the present amount of investment contribution.

Fifth, if MATAV is worried that in a competition it would have to lay off half of its workers in order to remain competitive, then this is an open admission that it would be able to carry out this task even with half as many workers. But, beyond this, the appearance of competition and several service companies would absorb MATAV's surplus labor force within a short time.

It Cannot Be Done Without the Law

There are still further arguments that support free enterprise. Having a telephone is a fundamental human right today. Not having a telephone is a violation of the citizen's freedom of speech. It is a violation of his right to have medical care, or to save lives in an emergency; and of his right to launch a venture. He who has no telephone cannot call the ambulance, the doctor, or the police when needed for protecting his life. He cannot call to ask a question of an expert in a program who is sitting in a TV or radio studio, and even though this may sound humorous, he cannot play Torpedo or other telephone games. Exercising these rights cannot depend on whether or not the person is able to pay the investment contribution to have a telephone installed. If monopolistic MATAV is unable to see to it that millions of citizens are not restricted in exercising their constitutional rights, then monopoly must be eliminated because it indirectly violates the constitution.

In this situation it is particularly unfortunate that the parliament does not want to discuss and enact the new telecommunications bill this year. The situation in the country is not going to permit much more delay. Each day of delay causes losses that can be measured in hundreds of millions of forints, just because of telecommunications. It would be good if the honorable representatives would still have a little energy left after their frequently time-wasting debates on many uninteresting

issues, and would pass, this year, a liberal telecommunications law that would serve the interests of both the consumers and the country, and which would be written in the spirit of competition.

CZECHOSLOVAKIA

Czech-German Joint Venture in Telecommunications

91AN0090X Chichester INTERNATIONAL TELECOMMUNICATIONS INTELLIGENCE in English 15 Oct 90 p 1

[Unattributed article: "Tesla and Philips—Partners in Telecommunications"]

[Text] Prague-based Tesla and Germany's Philips Kommunikations Industrie have reached an agreement in principle to form a joint venture covering the development and production of transmission equipment which will be used to upgrade the public telecommunications network in Czechoslovakia.

The project will focus mainly on digital signal transmission equipment, including Pulse Code Modulation systems, multiplex equipment, and line terminal equipment for transmission at speeds of up to 140 Mbit/s. The latter can be used with fibre-optic cable.

Philips says it hopes to conclude the agreement before the end of this year so that deliveries of equipment to the Czechoslovakian PTT can begin as soon as possible.

In July, Tesla Karlin and Siemens formed a partnership to manufacture EWSD digital switches in Czechoslovakia which will be used to modernise and rebuild the country's telecommunications network.

POLAND

Media Chief Outlines Radio-Committee Plan

LD0801223191 Warsaw PAP in English 2202 GMT 8 Jan 91

[Text] Warsaw, Jan 8—Meeting the press today, Marian Terlecki, the new president of the radio and television authority called radio-committee, announced the latter would be dissolved. In the communist period the radio-committee was a powerful propaganda tool.

The new president wants the Sejm (lower house) to transform the radio-committee into a council of radio and television which would be a social and not administrative body, one coordinating action and not directing it. Among its key tasks will be to decentralize TV programs by introducing local programs on Channel 2. Channel 1 is to retain its character while becoming more attractive.

New Radio, Television Chief on Television Plans

AU1601151991 Warsaw RZECZPOSPOLITA in Polish 9 Jan 91 p 1

[Interview with Marian Terlecki, chairman of the Radio and Television Committee, by Alicja Balinska; place and date not given: "An Uncontrolled Model"]

[Text] [Balinska] You spent 1990 as director of the television center in Gdansk, which earned a reputation as a maverick center. Why is this, and what happened?

[Terlecki] We wanted to create a broadcasting center that is not under any control. We thought the first step toward this should be the appointment of a national television council or national broadcasting council. Although the government has discussed this concept, the government views such a council as a purely administrative body of the state, partly supervised by the Ministry of Culture and Art. But we wanted it to be an independent body of experts who may not be employed either in television or in the state administration. This body would be appointed by the Sejm, Senate, and president for a six-year tenure. It would issue licenses to television stations before they begin to broadcast.

The appearance of private, public, or other stations seems inevitable because only competition can create a de facto pluralism in Polish television. One of the proposed council's major tasks would be the appointment of a director of the first channel.

[Balinska] The opinion was put forth in Gdansk whereby only the first channel would be state-controlled, whereas the second would be completely taken over by regional broadcasting centers. By what principles would this occur? Would it not be easier to create further television channels?

[Terlecki] For financial and organizational reasons, it will be a long time before a third and fourth Polish nationwide channel can be created. However, over the next two or three years it is necessary to decentralize and divide what there is already. Therefore the second channel should become a federation of regional programs.

[Balinska] You said all this more or less three months ago as head of the Gdansk television center. Have any developments occurred since then?

[Terlecki] No, there there has been no significant change.

Radio, TV Broadcasting Applications Increase

AU2503205391 Warsaw GAZETA WYBORCZA in Polish 20 Mar 91 p 5

[Article by (knysz): "About 350 Radio and Television Applications Submitted"]

[Text] There are about 350 applications for permission to broadcast radio and television programs waiting to be

considered at the Ministry of Communications. Seventy-five of them are for television stations and the remainder set out ideas for the starting up of radio stations. Most of the applications have come from Warsaw, Gdansk, Wroclaw, Poznan, Krakow, and Katowice.

As Marek Rusin, deputy minister of communications, told us on Monday, the ministry started receiving applications for the allocation of frequencies a year ago, but for the past two months there has been a flood of applications. "We have been receiving as many 20 applications a day," is what he told us.

Originally, there were plans to make the end of March the final date for the submission of applications. "However, common sense suggests that the deadline should be extended for at least another month," says Rusin.

The problem is that there is no radio and television law. The draft law envisages that permission to broadcast radio and television programs would be issued on a competitive basis and would be considered by the National Radio Committee, the Ministry of Culture, and the Ministry of Communications.

"Until a law is passed by the Sejm, we will only issue permits to use particular frequencies in cases that prompt no misgivings whatsoever," said Rusin. However, he added that he hopes that he will not have to do that.

Jacek Snopkiewicz, the former head of Television Information Programming, is one of those seeking permission to start up a private television channel. Along with Aleksander Jakubowski, Zbigniew Domaranczyk, Kazimierz Zorawski, and Maciej de Korczak-Leszczyński, former television news colleagues who also handed in their resignations in January, Snopkiewicz has set up the Wakat limited liability company. The company wants to operate a round-the-clock FM radio station and a round-the-clock television channel. The programs would be regional (they would be received within a 50-60 kilometer radius of Warsaw).

"We want our radio station to be informational and educate," said Snopkiewicz, "and, most of all, our radio and television stations will be independent of any kind of political influence whatsoever."

Wojciech Reszczynski, another former television news employee, has also applied for a frequency. Along with a company called Operator, he wants to set up a Warsaw radio station that would have the name "Wawa" and would provide 24-hour-a-day service in stereo on FM.

Those planning to establish Warsaw radio stations maintain that the capital's inhabitants will receive information fast from teams of reporters working out of automobiles. The radio stations would mainly provide information about what is going on in the capital, e.g., traffic jams, fires, meetings, and important events in the city.

Financing Telecommunications Modernization

91EP0324B Warsaw RZECZPOSPOLITA (ECONOMY AND LAW supplement) in Polish 11 Feb 91 p I

[Article by Krzysztof Szczesniak: "Financing Telecommunication: In Thirteen Ways"]

[Text] Communication between Poland and the world will be built in stages in the near future. The first concern will be providing connections from Poland and to Poland, or international connections. Then, intercity communication will have to be modernized, and finally, we will be able to think about a phone in every home in the city and in the village.

In practice, this plan will not be so clear, the scale of needs is enormous and there is little time. Then, too, the separate stages will grow cold or overlap. One thing that is certain, however, is that the years 1991-93 will be decisive. According to estimates, 17.5 billion zlotys [Z] will have to be spent during this period for development and modernization of the telecommunication network in Poland, Z4.5 billion in the current year Z6 billion next year, and Z7 billion in 1993.

Where will this money come from? Most of it will have to be our own money, and various kinds of foreign credits will be secondary. Each of the tasks, and there are an ominous thirteen, is precisely described. It cannot be otherwise; international financial institutions require this of us and negotiations are proceeding on the basis of these plans.

As an example, eventual credits from the World Bank in the amount of \$120 million and from the European Investment Bank in an amount of approximately \$80 million are now being coordinated. We would like to use this money to build 12 transit exchanges, two telex exchanges, a EUTELSAT satellite system situated on the ground, a center for supervising the network, and for training.

Funds obtained from French credit from the Alcatel CIT company would also be used to improve international communications. This pertains to E 10 B central exchanges with 314,500 connections for Poznan, including a pilot exchange, equipment, installation, and activation. This involves \$104 million; discussions are continuing and we cannot take the outcome for granted.

A similar intercity and international exchange should be put into service in Katowice, and this would require \$2.1 million. At the same time, the whole telecommunication network should be modernized in Katowice, including the purchase of four transit exchanges for the sum of \$42 million. Both of these capital construction projects would be financed within the framework of credit from the German Siemens company. At present, these negotiations have not been finalized.

Finally, as far as international communications are concerned, we must mention two exceptionally important tasks that were born quite long ago, but have grown to

realization only a few months ago. These are the purchase and location on Polish territory of coherent flexible fiber bundles creating east-west and north-south lines which would give us connections with other countries and yield profits for telecommunication transit services. Taking the foreign currency requirements into account, this would mean a total of \$56 million for which we are making application at the World Bank. Negotiations have begun, but it is difficult to say when they will be concluded.

At an identical stage, in the negotiation phase, are also such projects as: providing telephone service to Przemysl Voivodship within the framework of Italian credit (\$20 million), replacement of the telegraph exchange in Krakow and Lublin (a total of \$4.3 million), and replacement of the radio transmitter in Raszyn (\$3.5 million). The last two projects pertain to negotiated credit from the Swiss government. One must also mention providing telephone service to the Opole Voivodship, for which the Korean government has offered funds. We are speaking of \$50 million, but this all depends on discussions. Reconstruction of local networks in the Lodz loop and automation of the Skieriewice, Sieradz, and Ciechanow Voivodships would cost approximately \$200 million. We do not know whether we will succeed in realizing these plans. There is a long road between the proposals and the money in the bank in our own accounts.

As a matter of fact, at the moment we are certain—for they have been signed—of two sources of credit. The first is the business credit from the Siemens company for the reconstruction of telex exchanges in Warsaw amounting to as much as \$5.4 million. The second is credit from the Spanish government amounting to \$78.7 million, on very good terms, due to which we will be able to radically improve telephone connections in Warsaw in two years. Moreover, contracts have been concluded for almost \$59 million and delivery of purchased equipment continues. Thus, we can say that so far we have benefitted most from Spanish money and Spanish help, although little is said about this.

Polish Radio Programming Changes Outlined

*LD2103181991A Warsaw Television Service in Polish
1615 GMT 21 Mar 91*

[Text] The programs of Polish radio are going to be more clearly differentiated from each other. From 1 April, the Program 2 is to be devoted in its entirety to classical music and culture. From Monday to Friday a 15-minute cultural news program is to be broadcast. Magazines and reports from literary and musical events are envisaged; there will be no mass culture at all. The first program will be little changed, but will be heard more faintly due to maintenance work on a transmitter. The Program 3, despite competition from local radio stations, will maintain its profile and intends to be financed from advertisements. The Program 4 intends to cooperate with Radio Free Europe.

ROMANIA

Romania To Expand Telephone System

*91AN0176X Brussels EUROPE in English 12 Dec 90
p 18*

[Text] The German group Siemens has entered into partnership with the Romanian Postal and Telecommunications Office and with the Romanian company Electromagnetica for the annual establishment of 500,000 lines before 1992. The new company, Emcom, will be held at 49 percent by Siemens and the two Romanian companies will hold the remaining 51 percent. This represents an initial investment of 20 million German marks for Siemens, which will thus play a key role in updating the Romanian telecommunications network (which will be digitized in time).

YUGOSLAVIA

Travnik Begins Experimental TV Broadcasts

*LD2512141390 Belgrade TANJUG Domestic Service
in Serbo-Croatian 1138 GMT 25 Dec 90*

[Summary] Travnik, 25 Dec (TANJUG)—The first Travnik experimental TV broadcast began yesterday, but for the time being only those with cable TV—about 1,000 homes—can pick up a signal. Travnik radio has been on the air since 21 October 1967.

ARGENTINA

National Telecommunications Reviewed

91AN0167A Maidenhead TELEFACTS in English
Nov 90 pp 10-13

[Text] Since coming to power in July 1989, Carlos Menem has sought to stabilize Argentina's collapsing economy with a drive towards privatization. Menem's first attempts, in September 1989, ran into opposition from the powerful Peronist trade unions. The right-wing unions were alarmed to find that the president they had elected on a Peronist ticket saw the attraction of foreign investment as the only solution to Argentina's economic difficulties.

In December 1989, as the value of the austral again plunged and inflation began to soar, Menem embarked upon another attempt at privatization, with the focus on the notoriously inefficient and expensive telecommunications monopoly Empresa Nacional de Telecomunicaciones (ENTel).

The main cause of Argentina's long series of economic disasters since the 1940s has been the insular economic philosophy of Juan Peron. The Peronismo culture has been the historically dominant force in Argentine politics since the 1940s and remains a major obstacle to the successful privatization of ENTel.

Sixty percent of the company was agreed for privatization at the end of June 1990; Bell Atlantic, along with the U.S. bank Manufacturers Hanover and several Argentine companies are to control ENTel north, while the Spanish company Telefonica, with Citibank and the Argentine branch of Italian company Techint, will control ENTel south. The privatization will save the government the annual sum of \$1.46 billion. The deal was also Latin America's largest ever debt-equity transfer and enables Argentina to clear \$5 billion of its debt.

Although the privatization process has passed off smoothly enough, a good deal of controversy has centered around the actual value of ENTel and the nature of the debt-equity transfer has aroused trade union fears of ultimate control of ENTel resting with bankers anxious to recover bad debts. ENTel has a history of inefficiency, stemming originally from Peronist mismanagement and exacerbated by the incompetence of successive governments, either military or civilian.

In 1956 the Compania de Telefonos del Estado [State Telephone Company] was renamed ENTel as part of Peron's move towards "national integration." Effectively this meant that ENTel could only buy equipment from suppliers with factories in Argentina. Eager to seize upon a captive market, Siemens and Standard Electric were only too happy to install the first subsidiaries. At the end of the 1970s, Siemens decided to buy the Standard Electric installations, whilst the government let in NEC to prevent a monopoly. At the beginning of

1990, however, ENTel was still paying twice the international rates to keep the Argentine subsidiaries of NEC, Siemens, and their incompetent Argentine suppliers in business.

Argentina is a potentially rich country that has suffered from government mismanagement. It has considerable undeveloped natural resources and industry has spare capacity. Argentine assets are reasonably cheap and the privatization of ENTel is the first of a wave of privatizations aimed at emulating the success of Chile, which achieved an impressive economic turnaround with a series of privatizations in the 1970s and 1980s. Much hinges on the privatization: not only investment in modernization for ENTel, but also a new way out of debt for the Argentine economy.

ENTel is in urgent need of modernization and even hard-line Peronists seem to accept that foreign investment in the company is the only way forward. In mid-1989, Menem named Maria Julia Alsogaray, a staunch liberal and anti-Peronist as the head of ENTel, with a brief to achieve a 100-percent privatization of ENTel as soon as possible. The privatization agreement of June 1990 is, to a large extent, a compromise of Menem's original intention but still a step in the right direction. It will be a long time, however, before investment in the Argentine telecommunications sector will show tangible results in a modernization program, as trade unions and international financiers are drawn into conflict over the privatization of ENTel.

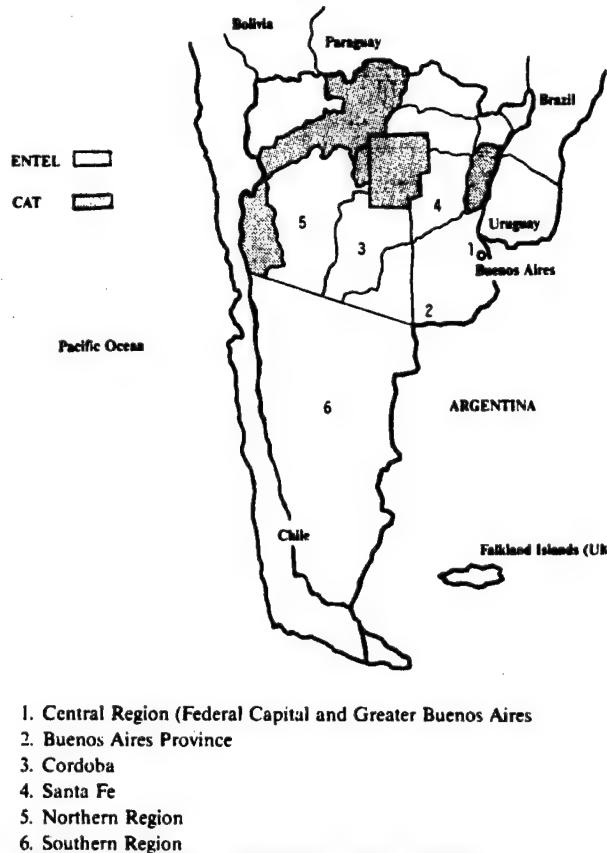
The PTT Today

Telecommunications facilities in Argentina are handled by the Ericsson-controlled Compania Nacional de Telefonos (CAT) and the state-owned Empresa Nacional de Telecomunicaciones (ENTel). CAT provides lines in the rural provinces of Entre Rios, Santiago del Estero, Tucuman, Salta, and San Juan. ENTel handles all other telecommunications facilities in Buenos Aires and the rest of the country.

CAT has been owned by L.M. Ericsson since the end of the nineteenth century. It avoided nationalization during the Peron years and operates as a private company. In some ways CAT, although much smaller than ENTel, appears to offer a much more efficient service.

At the beginning of 1990, CAT had installed 250,000 lines, representing 8.3 percent of the national total. In late 1989, CAT announced plans to move from manual switching to automatic switching, and it plans ultimately to move to a fully digitized service. CAT has also installed the first fiber-optic cables in Argentina. CAT and Ericsson have been included in the privatization talks but their role is yet to be defined. The company is obviously interested in being involved in the privatization process, but they are also quick to distance themselves from ENTel's notorious inefficiency, blaming ENTel for the poor quality of national services.

Regional Divisions in the Argentine Telecommunications Network 1990



Until 1990, ENTel operated as a highly centralized division of the Argentine Government. This changed in mid-1990 when privatization offered a drastic solution to the company's financial problems, as well as an opportunity to restructure the organization and create decentralized market-driven units.

The privatization process, however, seems to have created a certain amount of confusion. It emerged, for example, that neither of the original bidders, Bell Atlantic and Telefonica, were the main shareholders of the 60 percent of ENTel to be privatized. Manufacturers Hanover hold 52 percent of ENTel North, Manufacturers Hanover's Argentine partners hold 43.1 percent, while Bell Atlantic holds only 4.9 percent. Citibank holds 57 percent of ENTel South, Telefonica 33 percent, and the Italian company Techint 10 percent. Fifteen percent of ENTel is to be shared between employees and local cooperatives, while the remaining 25 percent will be floated on the Buenos Aires stock exchange.

The trade unions and independent observers in Argentina are worried that the privatization of ENTel will not produce the investment and dynamic new management

hoped for, but rather that the real owners of the company will be effectively bankers eager to recover a bad debt.

The Telephone Network

The telephone network in Argentina is out of date and overworked and ENTel has for a long time been unable to keep up with demand for telephone lines. Since 1975, the number of lines has been rising by about 4 percent a year, while demand has grown by a steady 10 percent. At the beginning of 1990, ENTel had approximately 2.8 million lines installed, but of these only 2.4 million lines were actually in service. In effect, ENTel is about 1.2 million lines short of meeting demand. This figure, surprisingly, has shown a downturn since 1985; a result of ENTel's "Megatel plan" which requires subscribers to pay for the equipment and cost of installation of lines, in other words about \$500 in a country where the average monthly wage rarely exceeds \$80.

ENTel's equipment is uniformly antiquated, and in many cases rapidly disintegrating into obsolescence. In 1989, ENTel released figures revealing that some 285,000 lines (10.2 percent) are more than forty years old; 75,000 lines (26.9 percent) are between twenty and forty years old; and only 1.8 million lines have been installed in the last twenty years. Automatic switches comprise 99.2 percent of switching equipment, but 67 percent of these automatic plants are controlled manually, 28 percent have computerized control but rely on electromechanical switching, and only 5 percent (about 150,000 lines) are digital. Although 81 percent of the cabling is under twenty years old, weak quality control and poor maintenance have made for a service which is unreliable and inadequate.

There are six primary toll cable routes, all extending from Buenos Aires. Four of these routes carry international traffic. The trunk network includes 22,000 km of high-capacity (300-1,800 channels) analog microwave with 49,000 voice grade circuits and almost 2,000 km of coaxial cable. All of these systems link up with five cross border cables to Bolivia, Chile, Brazil, Paraguay, and Uruguay. A connection across Brazil gives access through two submarine cables, Atlantis and Bracan, from Recife to Europe and Africa.

The most notable feature of the national network is the lack of redundancy, except for metropolitan Buenos Aires. Nearly 65 percent of all traffic is interurban, and 75 percent of this is in Buenos Aires. Over 30 percent of all international calls are to the United States, with Brazil, Italy, and Paraguay sharing another 30 percent. The absence of any alternate domestic routing and redundancy has led to the frail network capability outside Buenos Aires.

Intelsat satellite transponders bolster capacity and are mainly used for rural, domestic, and international services. In the rural areas, 28 earth stations provide services to villages in remote areas, mostly in the western areas and the southerly wilds of Patagonia. Two international satellite gateways, some 500 km from Buenos Aires, handle international traffic.

ENTel plans to increase the number of installed lines by 1994 by 50 percent, to approximately 5 million. The company also plans to modernize its equipment and facilities to cope with an increasingly sophisticated economic framework. However, according to observers, the investment needed to modernize and expand will be seven times the gross operating revenue forecast for 1994.

Mobile Communications

Cellular service began in Argentina in late 1989. The initial service is centered on the metropolitan Buenos Aires area and is provided by a consortium including Bell South Corporation, Motorola Inc., Citicorp, and the Argentine Macri Group. The initial subscriber base is 5,000 and this was expected to grow very quickly, by an overoptimistic ENTel, to some 46,000. Buenos Aires, however, does not really possess the sophisticated business structure necessary to sustain this kind of demand and the subscriber base is still limited to not much more than the original 5,000. The service area includes 12 million inhabitants and covers more than 4,000 square kilometers.

Data Communications

ENTel's most successful service is its public packet-switched network, Arpac. This became operational in 1982. It can be accessed via telephone or telex networks with transmission speeds of up to 9.6 Kbps, although the majority use is at 2.4 Kbps. There are 4,500 installed access ports, but by April 1990 there were only 2,553 subscribers due to operating difficulties. There are plans for an alternative satellite-based packet network, but these plans have been put on hold as the privatization process goes through.

Text Communications

ENTel's service facilities are generally newer than the basic service equipment. Most telex exchanges are operating with stored program control (SPC) switches. The network has four main switching centers and provides service to 53 provincial centers. At the beginning of 1990 the system had a capacity of 19,000 lines with some 13,000 subscribers. Argentina's telex service offers nearly all standard facilities including closed user group, multi-address calls, subscriber identification, indication of call duration, and collective numbers.

Video Services

Although there has been talk of experiment in the Buenos Aires region, there is, as yet, no videoconferencing service in Argentina.

ISDN

There are no clear plans for the development of ISDN services in Argentina. Nonetheless, ENTel has been following developments in other countries with great interest. The first phase of the installation of a digitized

network in Buenos Aires was completed in 1983. The network consists of six tandem switches and 58 local offices connected by 340 km of 34-Mbps fiber-optic transmission with 140-Mbps radio extensions and coaxial cable backup. However, as the majority of Buenos Aires' switches are antiquated step-by-step and crossbar switches, there is a long way for ENTel to go before ISDN is a serious proposition.

The Future

By the autumn of 1990, the future of ENTel looked uncertain, to say the least. In September, a month before the new owners of ENTel were set to take control, the unions declared a 72-hour strike in retaliation for 430 redundancies. More importantly, union leaders issued dark threats of "a war of industrial attrition" to exhaust the crippled company which, in 1989, had declared losses of \$1.46 billion. The handover of ENTel to its new owners in October 1990 began to look distinctly messy.

Disquiet began during the summer of 1990. The trade unions raised doubts over the terms of the privatization of the company and estimations of its true value. According to the trade unions, ENTel had been seriously undervalued and was worth some \$10 billion dollars more than it was sold for. As the share holders became increasingly nervous, further details emerged of the dubious nature of the financial transactions taking place.

According to the agreement of June 1990, 60 percent of ENTel was to be handed over to Telefonica of Spain and Bell Atlantic of the United States. Telefonica's bid was \$114 million cash, \$2.18 billion debt paper, and \$372 million interest outstanding. Bell Atlantic's accepted bid was \$100 million cash, 1.86 billion pounds [as published] debt paper, and \$372 million interest outstanding. Bell Atlantic's chief partner was the American bank Manufacturers Hanover, which already had substantial experience in Argentina's private sector. The trade unions were not altogether happy with the nature of the debt-equity swap, but immediate response to this agreement was muted.

When it emerged, however, that the new owners of ENTel were reluctant to invest in the sorely needed modernization program, and independent analysts, like Rodolfo Terragno (former minister for public works), published reports backing up the trade union's claims that ENTel had been undervalued, serious industrial strife seemed inevitable. As the October deadline for the transfer drew closer, Bell Atlantic and Manufacturers Hanover announced difficulties in raising the funds necessary to complete the bid, having failed to convince creditor banks to exchange Argentine debt shares for shares in ENTel. At this stage Morgan Guaranty Trust, original third in the bidding for ENTel in the spring of 1990, reemerged as likely shareholders.

The debt-equity terms of the ENTel privatization are being very closely followed by other Latin American governments, who see it as a possible solution to the debt spiral. For Telefonica, which also holds important stakes

in Chile's ENTEL and CTC telecommunications operators, the deal represents part of their long-term strategy to expand into Latin American markets. For the Argentine telecommunications sector, desperately in need of investment, the future still looks murky.

BRAZIL

German Satellite Found in Paraiba State Waters

PY2512012690 Sao Paulo *FOLHA DE SAO PAULO*
in Portuguese 23 Dec 90 p C 4

[Article by Joao Pessoa]

[Text] On the morning of 18 December, a satellite belonging to the Oceanography Department of the Cologne University Marine Science Institute in Germany fell ten miles south of Cabedelo Port near Joao Pessoa, Paraiba State.

The satellite was located on 21 December by skindiver Jair Cesar Miranda, president of the Paraiba Underwater Archaeology Institute, who spent three days searching for the satellite in high seas. Miranda learned about the satellite from fishermen who saw "a ball of fire" at about 0100 or 0200 on 18 December.

Jair Miranda brought up a 3-meter antenna when he located the satellite. He said the satellite weighs approximately 800 kg and is laying 22 meters underwater.

He believes the satellite must have been launched last year. He found some inscriptions on the satellite that say: "This is a sealed satellite with buoy and code number 12254. Whoever finds it please report the code number, where it is located, and its general condition." There is also a telex number (2926190) and a telephone number (432-5973801).

As of 1400 on 22 December, Miranda had not yet brought up the satellite. Aristides Paiva, deputy chief of Paraiba Port, said he is waiting for instructions from the Navy on what to do.

CHILE

National Telecommunications Reviewed

91AN0166A Maidenhead *TELEFACTS* in English
Nov 90 pp 6-10

[Article by Andrew Hussey of Datapro Research: "Telecommunications in Chile"]

[Text] Under General Pinochet's rule, Chile has gone faster and further in its drive to privatization than any other South American country. Institutions like the IMF have consistently held up Chile as an example to other Central and South American countries, encouraging them to follow Chile's example in cutting back the State and letting the private sector become the main force behind economic growth.

In the wake of Pinochet's successful coup in 1973, some 350 companies were privatized. From 1975 to 1982, 135 companies and 16 banks were sold off when Chile opened its markets to international trade.

As a result, foreign investment in Chile's telecommunications sector has made it one of the most highly developed and sophisticated in Central and South America. Nonetheless, the drive towards a deregulated environment has not been without complications, some of which are the result of a clumsy and over-zealous belief in the power of a deregulated sector, and others which are common to most other Central and South American countries.

The two main telecommunications operators in Chile, the Compania de Telefonos de Chile (CTC) and the Empresa Nacional de Telecomunicaciones (ENTEL), were deregulated in 1987 and 1988 respectively, as part of a series of privatizations which took place between 1985 and 1989. This wave of deregulation broke with a traditional insularity in Central and South America that places economic activities of "strategic interest" under state control.

Most significantly, Chile's foreign investment policy, the most liberal in the region, encouraged multinationals to bid for the Chilean companies which were available. In 1987, Bond International bought a controlling stake in CTC in 1987, and then sold it in 1990, at a profit, to Spain's Telefonica, thus enabling Telefonica to achieve its ambition of holding a controlling stake in both CTC and CTC's ex-partner and main competitor, ENTEL.

The privatization of CTC in 1987 was a major step forward in the development of Chilean telecommunications. Worried about the national security implications of privatization, the nationalist right forces initially opposed many privatization moves, whilst the dormant center-left, who advocated control by the state of "the dominant heights of the economy," opposed the sale of CTC to foreign interests. However, since Mexico's unilateral moratorium on its debt service in 1982 had provoked an immediate suspension of lending by private banks to all South American countries, Chile's access to financial resources was almost completely closed.

Bond International, however, convinced Pinochet to accept its bid with ambitious plans for modernization and a long-term investment program of some \$500 million, which aimed at doubling the number of telephone lines in the country by 1992. Under the "Plan de Corto Plazo" [Short-Term Plan], CTC aimed at extending the number of telephone lines from some 600,000 in 1987 to 1.2 million by 1992. By mid 1990, there were 704,472 lines installed and a telephone density of 7.7 telephones per 100 population. The "Plan de Corto Plazo" aims at 15.5 telephones per 100 population by 1992.

Similarly, Bond International set about introducing digital transmission and switching equipment, aiming at digitization of 70 percent of the Chilean telephone

network by 1992. According to the "Plan de Desarrollo" (Development Plan) released by CTC in the summer of 1990, this was still on track and the company was hoping to have digitized 80.1 percent of Chile's network by 1996.

The PTT Today

Chile's telecommunications industry is complex, although some measure of control has been successfully exercised by Pinochet's administration and, more recently, the centrist administration of Patricio Aylwin. The complexity is largely a result of the fervor for deregulation which made Chile a pioneer among Central and South American countries through the 1980s. At the beginning of 1990, Chile stood as one of the top fifty investors in telecommunications facilities in the world.

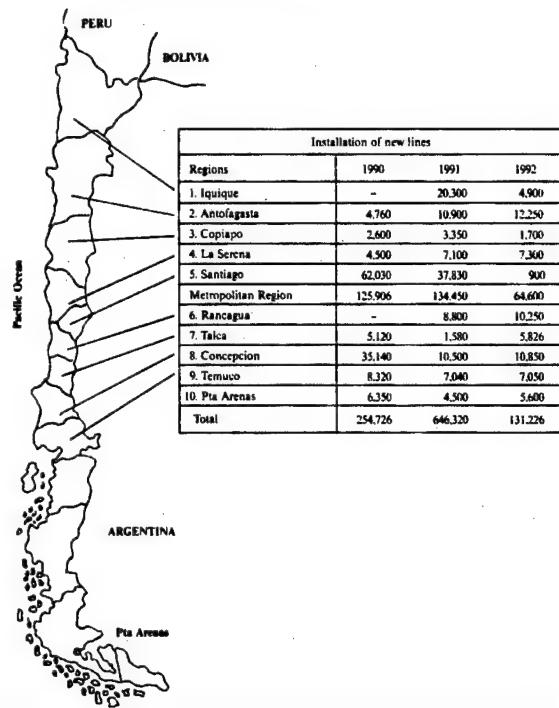
The telecommunications industry in Chile is dominated by Compania de Telefonos de Chile (CTC), which manages 96 percent of the country's telephone lines, and Empresa Nacional de Telecomunicaciones (ENTEL). There are, however, seven other organizations which handle variously the following areas: telex, international telex, international cables, and satellite communications.

Until 1987, both CTC and ENTEL had comfortably controlled completely different markets, with ENTEL controlling international links and trunk services, and CTC handling local networks. Since privatization in 1987, CTC has pursued an aggressive policy of technical and economic development. In 1989, CTC had a total of 188,292 installed lines, a dramatic improvement on the 37,589 lines installed when Bond International took over in 1987. In March 1990, Telefonica bought 48 percent of CTC from Bond International for \$388.5 million. Although Telefonica immediately faced pressure from the Chilean anti-monopolies commission to get rid of its stake in ENTEL, it is carrying out plans for development in both companies pending the commission's final decision.

ENTEL was privatized in 1988, when, in partnership with the Spanish Banco de Santander, Telefonica assuaged its disappointment at losing out to Bond International's takeover of CTC, by buying a 20-percent shareholding in CTC for \$53.7 million. This had an important impact on future strategy for both Bond International and Telefonica.

ENTEL immediately announced plans to challenge CTC in domestic telephone services. It sought government permission to build a digital telephone network of 100,000 phones in Santiago and in early 1989 began installing 5,000 telephones in the most affluent districts of the city. This placed ENTEL in direct conflict with CTC, which had stung ENTEL into action by setting up its own digital microwave link between Santiago and Valparaiso, and then installing a satellite transponder which gave it direct access to international communications.

Figure 1. CTC Development Plan



When Bond International finally withdrew from the fray in 1990 and conceded its holding in CTC to Telefonica, the telecommunications industry in Chile faced a whole new set of problems. Whatever the outcome of the anti-monopolies commission's investigations, however, the privatizations of the late 1980s have proved remarkably successful in attracting investment to the telecommunications environment and the modernization programs initiated by both CTC and ENTEL continue apace.

The Telephone Network

The telephone network in Chile is acknowledged as the most efficient in South America by investors and independent observers alike. Whilst most other countries on the South American continent are struggling to set up telephone networks fit for the 1980s, Chile has already started laying the groundwork for a telephone system for the 1990s. To this end, telecommunications operators in Chile have concentrated on development projects in three areas:

- The modernization of the system by adopting digital switching and transmission.
- The implementation of special services including facsimile and videotex.
- The implementation of a series of expansion plans aimed at increasing capacity.

CTC's investment program, which was initiated by Bond International and is being continued under Telefonica,

will add 600,000 new lines throughout Chile by 1992. In early 1989, NEC, in collaboration with C. Itoh of Japan, received a \$154-million order from CTC for switching and transmission equipment. The two-year contract included 27,000 lines of digital switching equipment, fiber-optic transmission equipment, and digital microwave transmission equipment. In mid-1989, CTC also announced a \$100-million bond issue in Santiago. In the same year, nearly 40 new exchanges were installed, together with some 188,000 new lines, making the network 99.3 percent automatic and 51 percent digital—the highest in Central and South America.

Total Projected Investment 1991-96: \$1,500 Million

| Main Projects | In Million Dollars | % Total |
|---|--------------------|---------|
| Installation of Lines ¹ | 953 | 65.4 |
| Rural Telephony and Public Telephones | 105 | 7.2 |
| Telephone Maintenance | 146 | 10 |
| Modernization of the Network ² | 253 | 17.4 |
| Total | 1,457 | 100 |

¹ Including \$100 million for low-capacity exchanges and replacement of manual exchanges

² Including long-distance public telephones, private data networks, and cellular services

Mobile Communications

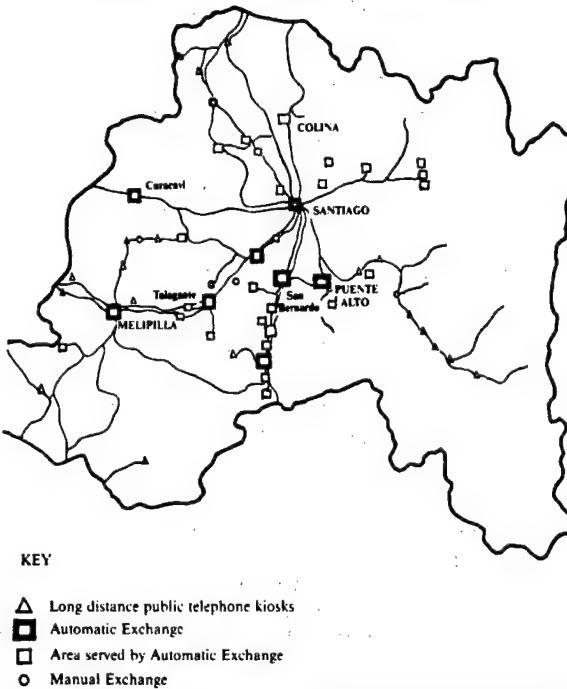
Chile has had considerable success with the development of its mobile communications. In 1989, the Chilean authorities licensed Novatel Communications of Canada and Cidcom SA, a Santiago-based joint venture with Pacific Telecom, to launch an 88-MHz cellular system serving Santiago and Valparaiso, in addition to the corridor between the two cities. Until 1989, the "Improved Mobile Telephone System" had been used in Santiago and Valparaiso with a limited success. The implementation of the 800 CM system provided by Novatel and Cidcom was a marked technological advance. By the beginning of 1990, the cellular network had about 5,000 permanent subscribers.

Data Communications

Since 1987, when CTC unveiled its first major development plan, and in the wake of Bond International's takeover, data communications in Chile have become the most sophisticated in Central and South America. Chile now has a variety of data services available, mostly under the control of CTC, but others operated by smaller, local private organizations. Services available include the public switched data network (PSTN), packet switched data network (PSDN), and private leased circuits.

In mid-1990, CTC opened the first digital data communications network in the metropolitan region of Santiago

Figure 2. Santiago Metropolitan Area



and La Quinta region. The first stage of this project provides medium- and low-speed data transmission, with transmission speeds of up to 9.6 Kbps, although it is mostly used at 2.4 Kbps.

At the beginning of 1990, CTC also began to implement its satellite services development plan. The first stage of this plan set up connections between Santiago, Arica, Iquique, Copiapo, La Serena, and Punta Arenas. The second stage will see a direct link established between Arica and Iquique. The satellite networks use a PAN-AMSAT transponder with 150 earth stations.

Text Communications

One of the fastest growing sectors in the Chilean telecommunications environment is the fax market. Both ENTEL and CTC are able to offer fax networks, but CTC has been quicker off the mark to expand outside Santiago and offer a more innovative market-driven service. By mid-1990, CTC has installed 61 Publifax centers destined for public use in 31 locations around the country. Santiago is the center for the international transmission of documents. The Publifax service is located in remote rural areas, like Copiapo, Quilpue, and Rancagua, as well as in the urban centers of Valparaiso, Antofagasta, and Vina del Mar.

CTC also operates the private Todofax service, which is by far the market leader in Chile, although smaller companies in the Santiago area offer a similar private

service. By early 1990, over 1,900 fax machines had been sold. CTC expects to have sold another 4,500 machines by early 1991.

Although the fax machine is catching up with the telex market, telex is still the most widely used text communications medium. CTC and ENTEL dominate the market in Chile's most far-flung provinces, but are in competition with smaller, but nonetheless successful operators, like Telex Chile, and Texcom Ltd, in the Santiago region. CTC offers leased line services to some 19,000 customers for voice, data, and telex transmission. Sixty-four percent of these customers are based in the Santiago region. CTC also offers a public teletex service that is accessed via the PSTN, although the number of subscribers at the beginning of 1990 was minimal (some 1,500). The supply of terminals for use of the service is open, but requires approval from CTC.

Video Services

In the summer of 1990, there were no established video-conferencing facilities in Chile. CTC had set up an experimental service, however, in Santiago. Future developments are subject to the 1991 development plan which aims at the establishment of videoconferencing facilities in 1992 or 1993.

ISDN

In the autumn of 1990, CTC included ISDN as part of its 1996 development plan. Between 1991 and 1996, CTC is aiming to improve the 1990 figure of a 60-percent digitized network to 84.1 percent by 1996. Experimental trials for a type of ISDN have been going on in Santiago, but CTC has so far been vague about releasing details. As Telefonica's influence increases, however, it seems more than likely that the technology used will be some variant on Telefonica's Red Digital Servicios Integrados (RDSI) [integrated services digital network (ISDN)], which integrates Telefonica's packet switched network IBERPAC, and the high-speed digital facilities called IBERMIC and SICE/IBERCOM.

The SICE (Integral Service for Business Communications) system is an intermediate service, employing pulse code modulation (PCM) transmission using coaxial cable and digital switching equipment from Ericsson. The service provides digital connections between local offices of one company situated within a given city. IBERCOM connects the offices of companies situated in several different cities. The integration of these systems is seen as the way forward for ISDN in Chile.

The Future

The modernization program in Chile continues swiftly and successfully. With Pinochet's demise, and the establishment of the Social Democrat Patricio Aylwin in

power, European and North American investors are beginning to look at Chile as a force for development. This may lead the way out of the cycle of poverty which has dogged the South American continent. The relative efficiency of Chile's telecommunications infrastructure is now being taken as a model for the rest of the continent.

Telefonica sees the establishment of a modern and reliable telecommunications environment in Chile as the cornerstone of its long-term strategy in Central and South America. As Europe draws economically and politically closer together, the Spanish Government has gone a long way to endorsing Telefonica's setting up of a second base in the continent that Spain has always dominated culturally and politically. To this extent, Telefonica's control of CTC and ENTEL is being closely watched by other Central and South American governments, aware of the implications this may have for them.

Telefonica's bid for control of CTC was, however, subject to the Chilean anti-monopolies commission ruling that Telefonica has to sell its 20-percent stake in ENTEL. This decision was based on the fact that until 1990, the two companies had been increasingly in competition in the long-distance market. Increased liberalization allowed both companies to break into each others' markets, but while CTC took advantage of this, ENTEL has been unable to respond by breaking into CTC's market and providing local lines.

Telefonica is adamant that it has a right to preserve its hard-fought-for stake in both companies and, in the summer of 1990, appealed to the Comision Resolutiva [Arbitrative Committee]. Telefonica sources stress that this is only a "theoretical conflict between the two companies," since as yet CTC only offers long-distance service in certain areas. Although Telefonica has said that it will abide by any final ruling, it is still developing plans for further investment in both companies, one of which is to increase its stake in ENTEL to 40 percent.

Whatever the final decision of the Comision Resolutiva, it seems clear that Telefonica's presence in the Chilean telecommunications market will remain crucial to future developments. Other operators, like Ericsson and Alcatel, are interested in serving the supply side, but are watching events unfold, rather than taking the plunge themselves.

Chilean ambitions are high and the country is starting to see itself as something of a economic leader in Central and South American terms. The telecommunications infrastructure is already in place for a flourishing market economy to develop into a more stable and solid structure. Continued political stability, the attraction of foreign investment, and a buoyant economy should ensure that Chile's telecommunications modernization program moves successfully through its second phase.

NICARAGUA

New Television Channel Slated for April

PA0501153791 Managua Sistema Nacional de Television Network in Spanish 0200 GMT 4 Jan 91

[From the independent Extravision newscast]

[Text] Work related to the installation of television channel four, the new television channel of the Nicaraguan people, is well under way.

Sergio Ramirez, president of channel four's board of directors, and Dionisio Marenco, executive director of the television channel, have visited the site where the installation of channel four's antenna is under way. The installation could be finished in mid-March and transmissions could begin in early April. Ramirez was very optimistic about the new television channel.

[Begin Ramirez recording] We are working to start channel four's transmissions in April. We have come here with Dionisio Marenco, who is the general manager of the television channel, to inspect the building of the

antenna's foundation. This will be the biggest transmission antenna in the country. It is nearly 100 meters high. Thus, with this tower and the transmitters, which are also very modern, we will have national coverage. We will carry good, independent, and pluralistic programming. Our programming will bring entertainment, information, and amusement to all Nicaraguans. We are also determined to raise capital for this channel, which is a new enterprise. We are getting in touch with investors in Spain, France, Venezuela, Colombia, and the United States in order to provide good programming and ensure strong financial support.

Therefore, since this is a new and independent company, our efforts are twofold. We want to have good technical quality, which is being ensured by the equipment we are installing, varied programming, and the financial backing that the company may obtain [sentence as heard].

In February we think that we will sell the shares so that people can participate as coowners of this television channel. Each share will cost \$100. We hope that as many Nicaraguans as possible, of those wanting to, will become shareholders of channel four. [end recording]

INTERNATIONAL

Libya, Sudan Sign Media Cooperation Agreement

LD1101121491 Tripoli JANA in Arabic 0915 GMT
11 Jan 91

[Excerpts] Tripoli, 11 Jan (JANA)—Minutes of the meeting of Libyan-Arab-Sudanese united action in the information and cultural sector were signed in Surt yesterday evening.

The minutes were signed by the [Libyan] secretary of the People's Committee for Information and Culture and the minister of culture and information in sisterly Sudan, brother Muhammad Khawjali Salihin. The minutes of the meeting include...[ellipsis as received] stressing the continued exchange of radio programs between the Great Jamahiriyyah radio and Sudanese radio in all spheres; necessary live coverage of national and pan-Arab anniversaries and occasions, and pan-Arab celebrations; prior coordination regarding programs; and removal of technical and financial difficulties. [passage omitted]

In the sphere of news, it was agreed to continue giving priority to the broadcasting of news from the two countries in radio and television bulletins, and to stress the easy flow of news via JANA and SUNA, via Arabsat. [passage omitted].

INDIA

'Leap in Communications Technology' for Army

91WD0540A Calcutta THE TELEGRAPH in English
12 Feb 91 p 5

[Text] New Delhi, Feb. 11—The Indian Army is acquiring the most modern integrated network system that would link various theatres of war to the command headquarters, making a big leap in communication technology.

This indigenously developed Army State Communication Network (ASCON) is comparable to the best in the world. With the installation of the network a commander at the Army headquarters can directly speak to the field units over a computer. The signal officer-in-charge of the Corps of Signals, Lt. Gen. S.G. Mookerjee, said the new system has very high data transfer rates and this kind of sophistication may not be available to civilians for another 10 years.

The Indian Telephone Industries are the turnkey contractors for the project and they have managed to pool in all available domestic talent and resources to build the system. The network will be able to transmit in three modes: voice, data and fax. The general said: "We are very much there" as far as progress in electronics is concerned.

Command, control and communications are the three basic elements required during war and the Corps of

Signals ensure smooth links between various field formations and the headquarters. The Corps of Signals have already developed and made operational another indigenously developed system—Army Radio Engineering Network (AREN) which is a battlefield area network system. This links up the area commander with various field units through voice, data and fax taking the computer to the battlefield itself.

This network has only two parallels in the world. One the RITA system of France and another PTARMIGAN system of the Britain. The system is multi-directional grid-based or a network of grids connected by line of sight medium (using microwave) laid in the battlefield. If one of the lines is destroyed by the enemy than the message can be conveyed through many other lines through a plethora of inter-linked networks. The general said that the system was user-friendly enabling a soldier with basic computer training to use it. All the soldier would have to do was to type in commands and the software installed would codify the message. A powerful computer aided by crypto analysts would crunch the information and relay it.

The Corps of Signals is celebrating its 80th birth anniversary and 10th post-Independence Day reunion on February 15. The Signals responsible for providing communications to the Army has gone through revolutionary changes commencing from use of Helio, flags and pigeons in computer. The new networks are now linked to satellite. It is also working on optical fibre technology and esoteric communication using meteor bursts.

The Corps is also working on the highly sensitive area of electronic warfare.

Need for Reorganization of Telecommunications

91WD0541A Madras THE HINDU in English
19 Feb 91 p 17

[Article by K.P.P. Nambiar]

[Excerpts] The Union Minister for Communications, Mr. Sanjay Singh, recently announced the formation of a high-level committee headed by the management expert, Dr. M.B. Athreya, to study and recommend the restructuring of the Department of Telecommunications and submit its report by February 22, 1991.

This most essential infrastructure for the economic development of the nation continues to be in very bad shape and in a state of indecision for several years now, despite some efforts to improve by way of formation of 'missions and Nigams'. In the present stage of economic development of the country, where information, business administration and security are of vital importance, the telecommunication system needs to be totally revamped through appropriate changes in structure which will provide motivation and competition resulting in quality of products and services.

The Telecom Commission was formed with great fanfare and amidst much expectations in 1988 after 18 months of deliberations at Government levels. Even after 20 months of its existence, there has been hardly any improvement. Likewise the formation of MTNL by merging Delhi and Bombay Telephones earlier into a single Corporation, did not result in DoT relaxing its stranglehold from the day-to-day running of this so-called autonomous Corporation. With centralised authority, there has been deterioration in various areas like research and development, type approval of components and equipment and introduction of new services. [passage omitted]

Organisational Structure

If we are to improve the telecommunication scenario in the country, one approach will be to have several smaller operating companies/corporations region-wise, and long-distance communications operated by two or three organisations to ensure efficiency and competitiveness. The regional companies should cover both cities and the surrounding countryside, so that larger revenues from the city can be utilised for the development of communication in the rural areas. This leaves no scope for exclusive corporation for two cities like the MTNL. These regional and long-distance companies should have full autonomy in building up their business in accordance with market forces and giving fullest satisfaction to their customers. FCC type regulatory bodies must be set up at the centre to ensure fairness of competition.

Type Approvals

Today there is inordinate delay in type approvals and often arbitrariness in deciding whether to take up for testing a product and even in issuing approval certificate, because of vested interest, or lack of any interest in the single user environment.

Interface approval of equipment and systems for use in the DoT network is carried out by the Telecom Engineering Centre (TEC). The TEC is inadequately staffed and it is inexperienced as there is a continuous transfer of people. For the introduction of equipment into the DoT network, there is the further step of Quality Assurance (Q.A.) approval. After interface approval is obtained, the Q.A. approval takes several months of further delay. After these two approvals are accorded, the report goes back to DoT which issues the final approval certificate after further protracted delay.

So far as type approval of components is concerned, this is carried out at the Component Approval Centre Telecom (CACT) of the DoT at Bangalore in association with TEC. Here again there is a widespread feeling that inadequate staff and infrastructure and the inexperience of staff are causing inordinate delay and introducing a certain amount of arbitrariness in testing and interpreting the test results. This has caused many good indigenous components not going into service while imports and drain on foreign exchange continue.

Component approval facilities have been established by the Department of Electronics (DoE) through various Standardisation Testing and Quality Control (STQC) Laboratories. Facilities also exist with the Electronic Components Standardisation Organisation (LCSO) of defence R and D. Many of the leading R and D organisations have also established their own type approval facilities. These could be made use of for both type approval of components and equipment with suitable augmentation of facilities. Type approval of equipment and components can then be done by independent laboratories fully authorised for according type approval. If required, new Type Approval Centres should be created independent of the user as has been done by the British Telcom, so that new components and equipment, manufactured in India and due for indigenous production can be type approved accelerating import substitution through local production of components and introducing new services through locally produced equipment. The quality assurance functions will also have to be done by qualified organisations authorised to do Q.A. inspection (like U.L. in the U.S.) in addition to customer inspection. [passage omitted]

Drawing Up Specifications

In today's practice in the DoT, there is a lot to be desired in drawing up of specifications for equipment and components and subsequent tests for type approval and finally Q.A. inspection. The specifications are invariably drawn up based on peculiarities of one or two manufacturers so that these can be obtained only by import or produced in collaboration with a particular manufacturer. There is also a tendency to over-specify, taking the best out of several foreign specifications. The specifications should take into account the place where it is used, conditions that prevail in India and the exact requirements of the user. [passage omitted]

Licensing and Control

Today the Department of Telecommunication is the administrative department for recommending licences for indigenous production of telecommunication equipment and components and import of components. This has two drawbacks, first they will try to hold on to the monopoly production of their own companies like ITI, HTL and Telecom factories and not allow others to enter the field. It may be recalled that all the licences for organisations in the private and public sectors to manufacture Telecom equipment since 1981 were issued when these powers were with DoE. (In fact DoT refused even to certify telephone instruments produced by GCEL, a Gujarat Government public sector undertaking in 1981-82 which was tested and approved to CCIT standard at Geneva reportedly to protect ITI's telephone market.)

Secondly there is still that image of import lobby dominating the DoT which will always have a bearing whenever local production of these equipment is proposed. The list of equipment designed in the last 20 years locally by the Telecommunication Research Centre and ITI R

and D, which either experienced long years of waiting to get approvals, or not allowed to be manufactured at all, are too numerous to mention.

FAX Machines Production

A recent case is that of the manufacture of FAX machines. In the last four years at least over 1,00,000 [as printed] Fax machines must have come into this country through channels including import through REP licence. Today the price of a FAX machine has come down to as low as \$400. All critical parts are also available off the shelf in the world market at a very low cost. If indigenously manufactured, at least 60 per cent value addition will result with very low investment using the existing infrastructures. The use of FAX will speed up business and communication in the country and result in savings all round. The revenue of DoT will also increase significantly. Ironically it was the Telecom Commission which has stood in the way of permitting indigenous production of the most vital communication media.

The DoT today also clears import licence for finished equipment used in the network. It also approves the equipment for use in the network, inspect them and finally use them for providing services. In other words the importer becomes the import licence recommending authority defeating the very purpose of checks and balances prevalent till 1988. The licensing activity should be restored to Department of Electronics which looked after this function till the formation of the Telecom Commission in 1989.

The Department of Telecommunications has been virtually running the ITI and HTL with most of the Board members drawn from DoT till 1988. In February, 1988, after three years of DoT's opposition and for the first time since 40 years of its existence, the ITI Board was reconstituted with six functional directors and limiting the DoT's representation to two members. Even after this the ITI does not have the freedom to proceed on its own economically viable plans of production or diversification without interference of DoT which has by now rendered thousands of people surplus. It is estimated that about 4,500 persons have no real work in the ITI, Bangalore, during the current financial year and another 4,500 will be added from the Rae Bareily factory by April, 1991. When the old technology was phased out, no new technology was introduced in synchronism, waiting for the fulfilment of the promise of "the best digital technology for the Main Automatic Exchange by December, 1987." Proposals for the second and subsequent switching production programmes to utilise effectively the labour force at Bangalore and Rae Bareily were politicised and drowned in the controversy of "Are you for or against the C-DoT" causing unemployment to 9,000 persons for no fault of theirs (who will, however, be paid their salary in full) and retarding the growth of the national communication network.

The attempt of ITI to go into VLSI chip manufacture mainly to meet its own requirement currently being met

through import, approved by its Board, DoE and Electronic Commission in 1988, has also been kept in cold storage by vested interests in the Telecom Commission. The report submitted in October, 1988, by the Indo-U.S. Joint Scientific Committee set up by the Prime Minister in 1985, which had given clear-cut direction for the VLSI production programme for India involving an investment of Rs. 2,000 crores between 1990 and 1995, has also found the dead end, thanks to the same vested interests.

It would appear that companies like ITI can only accelerate technological development and diversification, if it is out of the monopoly control of the user department and placed under DoE or other agencies like in the case of the Bharat Heavy Electricals Limited which operates outside the Energy Ministry.

Private Operation

The recent action of allowing private operation of ISD/STD phone booths, pay phones, FAX services, etc., has brought about considerable improvements to the public telecom service and shown what private entrepreneurship can bring to the telecom operation. The goals to be achieved in the telecom scene are to make available telephone connection on demand, improve the quality of services, lower the rates and offer diverse services. The experience world over shows that decentralisation, competition and people's participation in telecom organisations have made the achievement of these goals possible.

It is hoped that the report of the high-level committee will be made public soon after its presentation, unlike the report on the "evaluation and assessment of C-DoT" submitted by another high-level committee headed by the author on March 23, 1990 which never found the light of day except through selective leakages and distortions provided to the press by interested parties in the DoT during that period.

Handling of Satellite Communications Questioned

91WD0424A Madras *THE HINDU* in English
12 Jan 91 p 11

[Text] New Delhi, 11 January: Dr N. Seshagiri, Director General of the National Informatics Centre (NIC) today questioned the wisdom of the Department of Space (DOS) in choosing the C-Band frequency offered by Intelsat and other satellites for use by the Department of Telecommunication (DOT) and Doordarshan. As if it was an insult to injury, the fact that DOS had tied down the country to C-Band frequency up to the year 2000 AD was a 'very big mistake,' Dr Seshagiri asserted.

Delivering the key-note address at a seminar of information technology trends organised by Telematics India here, Dr Seshagiri said a proper satellite option should have been thought of before a decision was taken. Apparently, Dr Seshagiri had in mind the Ku-Band frequency available on some of the satellites launched by Intelsat, Japan and also the United States specifically for

domestic use. Not only was there a cost advantage over the C-Band, there was less interference and the higher frequency of Ku-Band also provided better service.

Another mistake: According to Dr Seshagiri, satellite technology the world over was undergoing a tremendous change and the era of cost effective micro-sat had arrived both for data and message communication. In this context, he said yet another mistake committed by the decision making authorities related to the choice of V-SAT (Very Small Aperture Terminals) which not only served the NICNET but also the proposed Remote Area Business Message Network (RABMN) to be operated by the DOT. He said the era of U-SAT (Ultra Small Aperture Terminals) had arrived which required an antenna of 1.5 feet diameter as against 1.5 metres for the V-SAT. Further, the cost of V-SAT was as high as Rs 3 lakhs compared to Rs 80,000 for the U-SAT.

New satellite: Dr Seshagiri announced that the NIC had decided to collaborate with a Canadian company for designing a new kind of satellite along with the necessary complement of U-SATs. As against the conventional satellite launch based on geo-stationary orbit, the one under contemplation of NIC would be based on stationary high altitude platform at a height of 21 kilometres above the earth. This particular satellite would be launched with the help of a highly sophisticated glider which can go on a two kilometre circular orbit with a belly powered microwave absorber. Though at the experimental stage the satellite had performed satisfactorily, plans were afoot now to make them commercially in about two to three years time. Dr Seshagiri said the satellite would cost about \$20 millions as against the conventional types which cost upwards of Rs 200 crores.

He said the cone of the new satellite will have footprint area of 1,000 kilometres and three such satellites can cover the whole of India. While one such stationary platform can cater to the entire northern belt, another can cover both the west and southern parts of the country and a third one the eastern flank of India. At a cost of Rs 80 crores we can have 10,000 earth stations of which 5,500 will be in the NICNET to service equal number of development blocks in the country and the remaining allocated to public sector units, banks and others. While at present, NICNET covered 450 districts in the country and also helped the public sector units to monitor both the cost and time overruns of public sector projects above Rs 100 crores. In due course even projects costing above Rs 25 crores would come in for cost and time overrun review.

The Director General of NIC told the seminar that he would not only depend on the DOS but also upon a large number of private sector units which had the component technology base to make the U-SATs. One has often heard of lethargy in the crucial department of Chief Controller of Imports and Exports (CCI&E) and with launch of this system, he said no official would be able to come out with any excuse for the delays in according

necessary approval. The satellite technology would then really serve the poor and not remain confined to the elite.

Economic implication: According to Dr Seshagiri, it should be realised that 10 years from now there will be neither information technology nor communication technology separately as both would be fused into computer communication technology and digital network would be the order of the day. In this connection, he remarked the economic implication of such a change needs to be realised by all particularly the Planning Commission because communication would mean not only voice but also data.

Telcom planning: Earlier in his inaugural address, the Minister of State for Communications, Dr Sanjay Singh said his ministry was conducting an exercise for identifying the right structure for telecommunications in the country. He said the telecom planning should be such that it not only enabled required type of communication on asking to the citizen in the urban areas but also be in a position to provide sufficient and suitable communication to the rural masses.

Incidentally, Dr Sanjay Singh sharing the dais with Dr Seshagiri appeared to enjoy the critical remarks made by the latter against the Planning Commission for not realising the emerging telecom needs. It may be recalled that THE HINDU had reported yesterday that the DOT had floated a proposal to import 1.5 million telephone lines worth over Rs 900 crores to clear the waiting list for telephones in the country. It was also stated in the report that the Planning Commission had not been consulted. Highly placed sources today told this correspondent that the Communications Minister Dr Sanjay Singh met briefly the Deputy Chairman of Planning Commission Mr Mohan Dharia yesterday afternoon. Though the exact details of the discussions were not known, it was understood that the minister had put forward the case of DOT requiring more funds especially in the next two years to increase the availability of telephones in the country.

Progress in Fiber-Optics Communications

91WD0500A Madras THE HINDU in English
23 Jan 91 p 3

[Text] Madras, 22 January—Fibre optics is assuming importance in the field of communications if the current developments are any indication. For the first time in the country, two railway stations, Basin Bridge and Vyasarpadi, are exchanging information on track movement through fibre optic channels.

The system has been developed through the collaboration of three organisations—Indian Institute of Technology, Madras, Electronics Corporation of India (ECIL), Hyderabad, and the Southern Railway.

Prof J. P. Raina and Prof Jhunjhunwala of IIT, Madras, said that the fibre optics signalling, voice and axel

counter information transfer system had undergone field trials for nearly a month now and the first phase of development had been successfully completed.

Representing the Southern Railway, Mr K.S. Kalidas, Chief Signal Engineer, said the operation of direct control of trains from the centralised traffic control had many advantages.

Mr N. Vittal, secretary, Union Government's Department of Electronics (DoE), today acquainted himself with the operations at the two stations. Mr T.N. Swamy of the ECIL, Hyderabad, outlined the salient features of the scheme to the officials from the DoE.

Problems With Foreign Technology Feared

*91WD0502A Madras THE HINDU in English
10 Jan 91 p 9*

[Text] New Delhi, 9 January—The Communications Ministry under the leadership of the Minister of State, Dr Sanjay Singh, is perhaps veering around to the view that "if you can't beat them you join them" no matter what the state of foreign exchange starved Indian economy is.

The debate, which has been raging for a couple of years now, as to whether the country should use its own technology or succumb to the pressures exerted by multinational telecom giants may be decided in the latter's favour if the ministry has its way. Last week, the Department of Telecommunications (DoT) gave finishing touches to a proposal to import 1.5 million telephone lines at a total foreign exchange cost of Rs 1,200 crores. This is to wipe off at one go practically the whole waiting list of 1.7 million telephone seekers concentrated mainly in the metropolitan cities.

Dr Sanjay Singh is expected to take up the matter with Finance Minister, Mr Yashwant Sinha shortly. Interestingly, the Planning Commission which is supposed to be associated with such a major question has been reportedly ignored right at a time when it is engaged in the serious business of compiling the Eighth Plan document with sectoral investment details.

Cost factor: Though the proposal has been sharply opposed by some senior officials of the Telecom Commission, at least one Commission member whose term will come to an end in less than three months from now seems to be in favour of the proposal. He has reportedly argued that the import of 1.5 million lines will not cost Rs 1,200 crores as made out by some but only Rs 900 crores at the prevailing cost. While the Rs 1,200 crores estimate has been arrived at using the rupee equivalent on the basis of per line cost of 2,300 French francs (1984 prices), the pro-import lobby has argued that the per line cost has actually fallen since 1984.

In any case whether it is Rs 1,200 crores or Rs 900 crores it hardly matters because the country's foreign exchange

reserves position to say the least is precarious and at the beginning of this year it was not more than Rs 3,000 crores.

It is not clear from where the foreign exchange would be arranged by the Communications Ministry though the supporters of the import proposal have been talking of obtaining supplier's credit. Even if credit is secured, the money has to be repaid whatever the terms. Further, it is also not clear whether all the 1.5 million lines would be imported from France's CIT Alcatel or from Siemens of Germany or any other source in the United States.

Future problems: Senior officials who have expressed serious reservation against the proposal feel that once the country imported a million and a half telephone lines from one technology source it may create grave problems for the telecom network in the future. The current installed capacity in the national network is around 6.5 million lines, which is expected to increase to 10 million lines by the end of Eighth Plan in 1994-95. By the year 2000, the installed capacity is expected to go up to 20 million lines. As of now every year roughly 1 million lines are being added to the capacity and in the assessment of the DoT, the economy can absorb 2 million lines annually.

The first Electronic Switching System (ESS) factory was set up in the Indian Telephone Industries (ITI) unit at Mankapur in Gonda district of Uttar Pradesh in 1984 with the collaboration of CIT Alcatel of France to manufacture the E-10B exchanges. As per the terms of the collaboration agreement which will expire in September 1991, ITI can renew it to get recent advance in the switching technology from Alcatel. As it is Alcatel technology accounts for 2.5 million lines of the total installed capacity and if further imports were to be resorted to from the same source and with C-DoT technology also round the corner, it will create a real jam in future with no options for a third technology.

Since ITI has not yet decided to renew its collaboration agreement, Alcatel has already signed a memorandum of understanding with the Modi group and the joint venture has applied for an industrial licence to manufacture digital electronic telephone exchanges with an annual capacity of 1 million lines. If this proposal also goes through, then Alcatel's hold on Indian telecom market would be considerable.

Permanent supply: Alternatively, the critics of the import proposal argued that if at all the government can allocate either Rs 900 crores or Rs 1,200 crores for the telecom sector, it would be better to utilise the funds for setting up new ESS factories in the country as it would ensure a permanent supply of telephone exchanges. This kind of money could easily finance the establishment of at least five to six ESS factories providing direct employment to nearly 12,000 persons.

It may be recalled that the Chairman of the Telecom Commission, Mr Sam Pitroda, had been arguing the case for using C-DoT technology in the new ESS factories.

Till now the C-DoT technology for only the 128 port RAX has been proved and productionised. Its larger version, the 512 port switch, has also been cleared for quality assurance and orders have been placed with the ITI by DoT to supply one 10,000 lines exchange and two 4,000 lines exchange by March 1991. If all goes well, these three exchanges may become functional by September this year.

Regarding the 128 port RAX, DoT has decided not to place any further orders on the nine licences on the plea that there is already an oversupply situation. As a compensatory step the DoT has assured these manufacturers that it would place orders on them after they get the prototype versions of the other two exchanges, namely 256 port RAX and 512 port switch cleared with quality assurance.

Mr Pitroda who went to the U.S. after his bypass surgery here is expected to return to Delhi on 17 January by which time the Sanchar Bhavan may once again become a battle ground where the officials may find themselves divided. While Mr Pitroda has been championing the cause of indigenous technology, C-DoT's, much promised big switch or Main Automatic Exchange (MAX) still remains to be delivered. The joke going around the corridors of Sanchar Bhavan in this context is "RAX a day is a hoax a day to keep the MAX away."

World Bank 'Preliminary Study' Summarized

*91WD0501A Madras THE HINDU in English
22 Jan 91 p 4*

[Text] New Delhi, 21 January—A World Bank mission will visit India early next month to make a comprehensive review of the country's telecommunications system. It is being undertaken in the context of an ambitious development programme suggested by the Department of Telecommunications (DOT) for making significant improvement in the country's telephone services by 2000 A.D.

In a preliminary study titled "Telecommunications in India: Policy, Research and Equipment Manufacturing," the World Bank noted that despite a variety of efforts over the past 20 years, India's telecommunication network remained inadequate. Besides long waiting periods for getting a telephone connection, there was also a very high percentage failure of local inter-exchange calls due to equipment malfunction or trunk system congestion and very high failure rates for subscriber trunk dialing (STD) due to both system congestion and poor maintenance.

Growth rate: Annual network growth in the eighties averaged about 7.5 per cent whereas the perceived demand grew by 10 percent yearly over the same period as a result of which the density of telephones per 100 population was among the lowest in Asia. In addition to the low level of telephone distribution, telex and more advanced telecom services were also poorly developed and unreliable. While there were many reasons for the

present situation, the Bank felt that the main reason was that the telecom sector had not been accorded high priority in the public sector investment outlays.

Further, organisational and institutional arrangements remained deficient with large delays in plan allocations and excessive centralisation and regulation that was "unsuited for high technology service," it said. The poor quality of service was mainly due to sub-standard equipment, poor maintenance, lack of spare parts and tools and ineffective traffic management.

The World Bank study quoting the programme drawn up by the Telecom Commission noted that in the initial phase of the Plan between 1990-2000 (that is Eighth and Ninth Five-Year Plans) it was proposed to increase the telephone lines from about 4.6 million in 1989-90 to about 9.8 million by 1994-95. This would require an addition of about 6.5 million lines if replacement of expired exchanges were also taken into account. If that happened the results would be significant and the telephone density would double to about 1-1 per 100 of population and rural telephone availability would increase such that 5,70,000 [as published] villages in the country would have at least one telephone each.

The Bank felt that achievement of these goals would require prodigious effort (bearing in mind that only 1.65 million lines were added in the Seventh Plan), as it would mean an investment of Rs 19,700 crores or \$11.6 billions. Even though the Telecom Commission has held out that 70 percent of the resources would come from internal cash generation, 23 percent from market borrowing and 7 percent from the Central Government budgetary support, the World Bank noted. "It was far from clear that these resources would be available or could be mobilised given the present fiscal difficulties of the Central Government."

Self reliance: It said given the past performance, serious doubts surrounded the implementation capacity of the DoT, notwithstanding the planned organisational adjustments and staff training. According to the Bank, a final caveat related to the indigenous production capability (about 500,000 lines in fiscal 1988-89) and its ability to expand the capacity for production of switching, transmission and terminal equipment. While noting that more than 90 percent of the telecom equipment used in India was made locally, 'the strong policy of self reliance and indigenous technology development' operated through ITI, HCL and HTL 'had not served India well.' The lack of competition with mutual dependence between the buyer and the manufacturer, lack of appropriate penalty clauses in purchase contracts and prices calculated on a cost plus system had resulted in poor quality equipment at high prices.

The World Bank said even after the policy changes initiated in 1984, the telecommunications in India was in a state of transition and many problems remained with system operations and organisation structures. The manufacturing sector was also highly protected from

international competition. While admitting that domestic production had increased, it said 'it was not yet clear whether the existing procurement practices will operate in a manner that penalised inefficient firms and rewarded the most cost effective.' While some progress had been made in the indigenous digital switching technology, considerable uncertainty still surrounded the C-DoT's ability to successfully develop and introduce to production a large size (15,000 to 40,000 lines) electronic local exchange within a reasonable time frame, it said.

According to official sources, while the World Bank might review the telecom status in India and accordingly prepare a plan, the DoT was more interested in securing a loan of Rs 600 crores (approximately Rs 200 crores a year) for financing vital component imports. It may be recalled that under the ninth loan, the World Bank had approved a Rs 345 crore credit to the DoT of which only about Rs 170 crores had been utilised. Mid-way, the DoT wanted the character of the loan to be changed to accommodate its need for importing components which was turned down by the Bank. It was perhaps in December 1990, the Finance Ministry signed an agreement with the World Bank foreclosing the Rs 345 crore loan.

The first draft of the study to be completed by the World Bank in March 1991, will cover four areas. These include (a) development plan, (b) system policy framework and system administration, (c) technology, design and research capability and (d) manufacturing capability. Regarding the development plan component of the study, it was stated that as the planned expansion in the network was to proceed over many years, it would be important to ensure that the technology that was being introduced contained sufficient, inherent flexibility to adjust to changes that might occur in telecom technology over the next decade and beyond. This would also involve analysis of the financial implications of the proposed network expansion.

Key element: In the second component dealing with the system policy framework and administration, the Bank in its preliminary study already noted that a key element in it would be the evaluation of human resource constraints of the DoT and how it would impede implementation of planned improvements in systems operations and expansion.

As regards the section on technology, design and research capability, the Bank observed that given the rapid pace of technology change in global telecom scene, it was crucial that whatever technological change that was adopted, sufficient inherent flexibility within the system to absorb these changes should also be ensured. In this context, the World Bank is proposing to make a thorough analysis and evaluation of the role and capabilities of the C-DoT.

SRI LANKA

Government To Upgrade Telecoms Services

9IAN0129A Chichester INTERNATIONAL TELECOMMUNICATIONS INTELLIGENCE in English 19 Nov 90 p 19

[Unattributed article: "ADB Loan Approved for Telecoms Upgrade Project"]

[Text] The Asian Development Bank (ADB) has approved a \$41.1-million loan to Sri Lanka Telecom (SLT) to assist in the financing of a project to expand and modernise national and international telecommunications services throughout the country.

The overall \$62.1-million project involves the construction of a new satellite earth station and a second gateway telephone exchange for the expansion and upgrading of the international telecommunications network; a microwave link to connect the satellite earth station and the telephone exchange; the expansion of the long-distance trunk transmission network to relieve congestion and to meet forecast traffic increases; and the development of information systems, including the upgrading of customer billings and the provision of improved computer equipment and software.

Consultants and their services will also be required for preliminary designs, preparation of tender documents, supervision of installation, and acceptance testing.

The remaining \$21.0 million constitute the local currency costs of the project, which is expected to be completed by the end of 1994.

The ADB has also agreed to provide a \$460,000 technical assistance grant, to be financed from the Japan Special Fund, for the institutional strengthening of SLT.

Last year, consulting engineers Ewbank Preece conducted a survey, on behalf of the ADB, which involved calculating telecoms traffic and demand forecasts up to the year 2005. The company predicts that 400,000 new telephone lines will be required to expand the Sri Lankan telecommunications network to keep pace with demand up to the year 2005.

SOVIET UNION

Mobile Phone Net Test in Estonia

*91P20138A Helsinki HELSINGIN SANOMAT
in Finnish 9 Jan 91 p 6*

[Unattributed article: "NMT 450 Mobile Phone Network Being Tested in Estonia"]

[Text] The NMT 450 mobile phone system, which is used in the Nordic countries, has started undergoing testing in Estonia since the beginning of the year. The Estonian net will be in test operation for NMT customers in the Nordic countries for a period of three months. The Estonia NMT net at first will be backed up by the Finnish mobile phone net. Estonia base stations have been linked to the Finnish NMT center, so that all calls will go via Finland. The coverage area of Estonia's net will in the beginning stage include only the center of Tallinn. According to the Mobile Phone Service Department of Tele [Finnish Telecommunications Agency], calling in Tallinn with the NMT phones is done just as in Finland. When phoning in Tallinn, it is necessary to use the country code for Estonia, which is still S, or the same as Sweden's.

Estonian Radio Director Protests 'Jamming' Claim

*LD2701143191 Moscow Domestic Service in Russian
0822 GMT 27 Jan 91*

[Excerpt] [Announcer] Our correspondent in Tallinn, Andrey Trapeznikov, is now on the line to our studio. We are ready to listen to your report.

[Trapeznikov] I began my working day today by ringing the officer on duty at the republic's internal affairs directorate. He told me that the night had passed peacefully. I asked him what he thought about the joint order of the ministers of defense and internal affairs on the institution, from 1 February, of joint patrols on the streets of republican capitals by militia and the Army. It serves no purpose, was his answer.

As I have now been in Estonia for some time, I will tell you my own view. The implementation of this order may not only destabilize the situation here—it will certainly cause additional friction between the republic and the center. By the way, Edgar Savisaar, chairman of the Estonian Government, has already said that he will work for the abolition of the order on Estonian territory.

Peeter Sookruus, director-general of Radio Estonia, has sent a protest to the USSR State Television and Radio Committee and to Leningrad Television over material by Aleksandr Nevezorov on the situation in the Republic. The protest rejects claims made by Nevezorov, particularly, that the Intermovement radio station Nadezhda is the only source of radio broadcasting in Russian, and that its transmissions are subjected to jamming. Statements made by Nevezorov that the moment the last soldier leaves Estonia the blood of the Russian people will be spilt are provocative, the protest note says. They

also insult the Estonian people and aggravate confrontation between peoples. Estonian Radio has demanded an explanation for these statements. [passage omitted]

Kazakhstan Launches Satellite TV Broadcasts

*PM1001095791 Moscow KRASNAYA ZVEZDA
(first edition) in Russian 9 Jan 91 p 4*

[Article by Colonel A. Ladin: "Space Link for Kazakhstan"]

[Text] Kazakh SSR [Soviet Socialist Republic] President U. Karamanov is linking the possibility of setting up a satellite television system in the republic with conversion of defense industry enterprises.

The Kazakh Telegraph Agency reports that a powerful television station enabling reception of television programs via satellite has been put into operation in Alma-Ata. As early as the beginning of the year, 15 Kazakh rayons which did not get television broadcasts from Alma-Ata will start receiving programs from the republic's television center.

Demonstrating the new television station's capabilities, specialists showed the prime minister a program from the U.S. CNN Corporation. All that remains to be done is to resolve legal and financial questions so that programs received from the U.S. channel can be included in Kazakhstan television's output.

Pro-Soviet 'Underground' Radio Operating in Baltics

*LD0801150891 Vilnius International Service in English
2230 GMT 7 Jan 91*

[Excerpt] [passage omitted] This is really a pro-Soviet radio station. It belongs to the Lithuanian branch of the Communist Party of the Soviet Union. However, this station is not registered in any legal way, so in fact it is an underground radio station. Its name is Tarybu Lietuva, which means Soviet Lithuania in Lithuanian.

The studio of the station is located in Vilnius, or to be more exact in the former Communist Party High School building in Shevchenko Street. The transmitter supplied by the Soviet Army is located in a military base in the far northeastern part of Vilnius, with the coordinates 25 degrees 26 minutes eastern longitude and 54 degrees 45 minutes northern latitude. The power is estimated to be between 10 and 30 kilowatts.

The station operates on 864 khz medium wave and their official schedule—which, by the way, is (?however) not always observed—as is follows:

- In Lithuanian, at 13, 17, and 20 hours UTC [Coordinated Universal Time].
- In Russian, at 1345, 1745, and 2045 UTC.
- In Polish, at 1430, 1830, and 2130 UTC.

The programs are comprised of propaganda material opposing Lithuanian independence and supporting the idea of the leading role of the Communist Party of the USSR in Lithuania. It also calls for the implementation of the so-called presidential rule of Gorbachev in Lithuania, and backs the movement for secession of the regions inhabited most by non-Lithuanians from the Republic of Lithuania.

One may naturally ask if the station is unlicensed, and its programming is so subversive, why doesn't the police raid the station and close it down? Well, the reason for this is that the power of the Lithuanian police does not extend so much. The military base in which the transmitter is located is, of course, controlled by the Soviet Army—but moreover, the building of the former Communist Party High School is also under the control of the

Soviet Army, which occupied it several months ago. So although we do not know almost everything about the radio station Tarybu Lietuva, we can't do anything to prevent its broadcasts.

There are similar radio stations in other Baltic states—I mean in Estonia and Latvia—as well. In the case of Estonia, it's the Radio Nadezhda, or Radio Hope, operating on 747 khz from a military tank base in Kehra with the coordinates 24 degrees 11 minutes eastern longitude and 59 degrees 18 minutes northern latitude. This station also plans to open a TV channel in the near future. We don't know, however, the exact name and location of the Latvian counterpart. The only thing I can say is that it also operates from a military base located near Riga, the capital of Latvia. [passage indistinct]

EUROPEAN AFFAIRS**Europesat Ratified; Satellites To Be Built**

91AN0202X Paris ELECTRONIQUE HEBDO
in French 10 Jan 91 p 16

[Article signed P.A.: "Europesat on the Launch Pad"]

[Text] The Europesat program, the second-generation direct-broadcast satellite project of the European Eutelsat organization, has been given the go-ahead. Nine countries, including France and Germany, have indeed ratified the memorandum of understanding which now authorizes Eutelsat to prepare a request for proposals for the contract to build the Europesat satellites. The request for proposals is to be issued within six months.

The European organization is planning three operational satellites by 1996-97 as well as one spare in-orbit satellite. These four satellites will be located at the same orbital position of 19° West. This is not an accidental position: It was selected to ensure continued service—an indispensable condition for France—of the current direct-broadcast satellites TDF1/TDF2 and TVSat.

Moreover, the nine countries (Germany, Austria, France, Italy, the Netherlands, Portugal, Sweden, Switzerland, and Yugoslavia) requested at least 39 transponders for Europesat. Consequently, Eutelsat has to upgrade its project, which provided for 12 channels per satellite and 125-watt traveling-wave tube amplifiers. To this end, 5 million European currency units (i.e., about Fr35 million) have been allocated to perform these technical studies.

The first satellite could be launched in 1996 if the time schedule is maintained; the other launches would follow at the rate of about one launch every six months.

Possible Duplication of Standards by 1996

Coverage of Europe will be provided by steerable circular and elliptical spot beams which should furnish one EIRP (equivalent isotropically radiated power) of about 50-60 dBW throughout the area. As of 1996, it will thus be possible to duplicate networks in the HDTV standards and to keep telecasting in SECAM or PAL as well. However, due to the power of the satellite-borne transponders, TV viewers will have to obtain antennas 60-90 centimeters in diameter in order to have good reception of HDTV programs.

The Eutelsat organization has got down to another job, specifically at France's request, which has experienced a few setbacks in securing TDF1/TDF2. Eutelsat is indeed studying the possibility of launching an "intermediate" satellite by 1993 which would have the same basic specifications and would make up for the deficiencies of the TDF1/TDF2 tandem.

EC Reexamining Telecommunications Monopoly

91WT0102A Vienna DIE PRESSE
(telecommunications supplement) in German
23 Jan 91 p 1

[Article by Walter Jaburek: "Weakening of the Communications Monopoly in the EC? More Energy and Movement From New Telecommunications Law"]

[Text] The breakup of the telecommunications monopoly in the United States, Japan, and Great Britain has put the EC under pressure to rethink the question of the organizational regulation of communications in its member states. There are economic considerations behind these efforts:

—Liberalization—primarily in the United States and Japan—has brought energy and movement into both the equipment industry (fax machines come almost exclusively from Japan) and into the group of service industries (the biggest providers of value added services in Austria are IBM, GEISCO and EDS—not a single European company). This is most apparent in the aggressive entry of Japanese and U.S. service industries into business in eastern Europe, and there it is mostly into the highly profitable market for mobile telephones (nota bene, not as the supplier of equipment but as the operator). Even in this area European firms have had hardly anything to offer.

National Specifications Hamper Communication

—The complexity of switching is becoming greater all the time. Development costs for a new telephone exchange in 1970 came to about 300 million Austrian schillings; in 1990 it is about 1.4 billion. In order to finance this expense, a telecom supplier has to sell to at least 8 percent of the world market. The basis for every telecommunications supplier's success is the domestic market, which in the case of the former FRG amounts to 6 percent of the world market at most. The conclusion is: In the future only those telecommunications suppliers who have a domestic market the size of that of the United States, Japan, or Europe will stay in the marketplace. Special developments for individual countries, such as those still being financed by the Austrian telephone user, will cease in the future.

—The European economy is not exactly being advanced as a result of the national specifications for telecommunications. A few examples: a telephone call between the same points inside Europe, depending on who is calling and who is paying, can cost up to twice as much as a call in the opposite direction. Terminals that have long been approved in one country are never licensed in other countries because the renewed testing is simply too expensive and time-consuming for the supplier. A German (or Austrian) car phone is useless outside its country of origin and, according to radio regulations, would have to be removed from the vehicle at the border. At the present time, in order to make a telephone call from one's car all over Europe,

five different pieces of equipment are needed. As the result of independent developments in the data network sector, data transmission within Europe costs about four times as much as for comparable distances in the United States. At least four standards (with variations) exist for video text in Europe. This device has met with success only in France, because terminals were given away for the price of a telephone.

So the EC is working towards a unified telecommunications market for services (primarily for value added services) and equipment. In the year 2000, according to EC estimates, the telecommunications industry will make up about 7 percent of the economy (as opposed to the present 2 percent). About 60 percent of all jobs will depend directly or indirectly on information and telecommunications technology. So the EC, with one of the most important papers on the subject, the "Green Paper on the Development of the Common Market for Telecommunications Technology and Equipment," known as the "Green Book" for short, is pursuing the objective of promoting discussion on the subject of standardized telecommunications within the EC. This will mostly take the form of a broader selection of qualitatively better and less expensive services.

Opening the Market for Terminals

The Green Book proposes the following regulatory measures in particular:

- Opening the (terminal) equipment market to free competition. This includes full mutual recognition of terminal certification, the public listing across Europe of major contracts for switching and transmitting installations, and finally the intensification of standardization efforts through the establishment of a European Telecommunications Standards Institute (ETSI).
- Common conditions for use in the public transmission network for (value added) service providers and users: interfaces for terminals, conditions for use, rate principles, and the frequencies for radio broadcasting services are to be standardized across Europe.
- Opening the national communications network for links with international telecommunications service industries.
- Clear separation of telecommunications authorities and service industries.
- Mathematical separation of telecommunications from other services (e.g. mail) to monitor the fair price of services.
- Coordinated introduction of European services, beginning with telephone, telex, teletex, video text, package-switched and line-switched data networks, including ISDN [Integrated Services Digital Network] and down to the mobile phone ("car phone"), also the development of a trans-European wideband network

(RACE [Regional Automatic Circuit Exchange] program) and the promotion of value added services such as EDI [Electronic Data Interchange] (TEDIS [Tele-Data Information System] program) and the standardized use of satellite communication.

—A common voice on behalf of European interests in the event of the establishment of international standards and GATT.

There will be two types of services as part of promoting competition: those that are to be reserved for a particular time or (always) for the network operator ("telecommunications administration") (usually the telephone service), and what are known as "competitive services." The latter can be offered by anyone and for the most part will include the so-called "value added services". The telecommunications administration is obligated to make lines available to the operators of competitive services at fair conditions. The administrations will continue to have the right to offer competitive services.

Within the proposed guidelines for Open Network Provisions (ONP) the following points in particular will be regulated:

- Free access to and the free use of rental lines at justified prices (the banning of co-use or a link with other networks is possible only until 1992);
- A certification process for terminals that is clear and in conformance with the principles of the rule of law;
- Standardized procedures for access to package-switched data networks.

The EC's present telecommunications law is still in its beginning phase. However, the principles are laid down in the Green Book and are accepted by all members of the EC. So the overhaul of telecommunications law is being discussed in Austria between the social partners. If Austria were to join the EC, fundamental changes could be required here.

CANADA

Telesat Mobile Signs Deal To Buy Satellite

91WT0078A Toronto THE TORONTO STAR
in English 20 Dec 90 p C3

[Article by Philip DeMont]

[Text] Telesat Mobile Inc. has signed a deal to give the Canadian mobile communications company its first satellite by 1994.

The Ottawa company announced yesterday that it, along with American Mobile Satellite Corp., will spend \$240 million over three years to buy two specialized satellites.

The new orbiting vehicles should let both companies provide enhanced, mobile communications, officials said.

"Once we get the satellites up, we will be offering services that no one else will be offering," said Janis Downey, a spokesperson for Telesat.

Now, Telesat offers a variety of mobile communications services to Canadian trucks and ships, among others. But, Downey said, the company has to rent space from existing orbiting vehicles, which limits the number of services Telesat can offer.

The new satellite would let Telesat offer voice, facsimile and date mobile communications, Downey said.

California-based American Mobile is purchasing a similar satellite. The two companies have an agreement to provide backup service to each other, she said.

Montreal's Spar Aerospace Ltd. received the contract to build the innards of the two satellites while U.S.-based Hughes Aircraft Co. Ltd. will construct the spacecraft buses to send the vehicles into orbit.

Telesat Mobile is a private company owned 50 percent by Telesat Canada, 30 percent by Unitel Communications Inc. and 20 percent by a Japanese firm.

FRANCE

European Space Agency Affected by Budget Cuts

*91WT0110A Paris LE QUOTIDIEN DE PARIS
in French 2-3 Mar 91 p 11*

[Article by Pierre Jovanovic]

[Text] With Jean-Marie Luton at the helm for the past five months, the European Space Agency (ESA) now enters a strategic period with its three major programs: Ariane V, the Hermes space shuttle, and the Columbus orbiting space station. Even as Ariane prepares, if everything goes well in Kourou, to orbit Astra 1B—along with a direct television satellite and the MOP-2 meteorological observation satellite for the European Agency—yesterday Luton announced a 3.3-billion-ECU [European currency unit] cut in the 1986 to 2000 budget that was originally set at 33 billion ECUs.

The Hermes and Columbus programs will be the first to suffer from this 21-billion-franc cut, but the ESA is not the only agency to tighten its belt. After all, NASA must cut \$6 billion from its Freedom program, the station with which the European laboratory Columbus will dock.

The first unmanned flight of the Hermes is scheduled for the year 2000 and the first manned flight for 2001. The orbiting of the European space platform, along with that of the Columbus, is scheduled for 1998. As for the minilaboratory, its launching depends on the Hermes shuttle. Launching of the laboratory was initially set for the beginning of 1997 and that of the European minilaboratory for the beginning of 1998, with visits by the Hermes shuttle every six months. The ESA prefers to

wait until 1996 to finalize that program. Consequently, the study phase for the European space aircraft will not be completed until the end of this year.

In contrast, the Ariane V program will not be modified, particularly since engineers have already obtained the nominal thrust of the engines. Other projects, such as observation of the earth using the ERS1 satellite (launching on 5 May 1991), telecommunications starting in 1995, and scientific plans (Cassini-Huygens probe) should not be subject to delays.

The Council of European Space Ministers should give the plan the go-ahead at its meeting in the fall of 1991 while headed by a German, but many officials expect nothing positive to come from any directives that might be issued by the Council in response to the recession and economic cuts imposed on Germany as a result of reunification.

GERMANY

North Rhine-Westphalia Promotes Teletech NRW

*91P20157Z Duesseldorf HANDELSBLATT in German
4 Jan 91 p 16*

[Article by Dr. Bernd Kuhle, consultant with SCS Informationstechnik GmbH, Telecommunications Branch: "NRW Land Government Promotes Telecommunications Industry With Teletech: Consulting Services Gratis Under the NRW-Land Project"]

[Text] Communications technology and its application are regarded by numerous specialists as an economic engine for the 1990's. The North Rhine-Westphalia [NRW] Land Government has recognized the major significance of this sector for the economic development of the Land and, in order to provide NRW with an advantage, plans to sponsor the development and application of modern telecommunications technology in NRW through its "Teletech NRW" program.

Teletech NRW is aimed at stimulating the development and expansion of a future-oriented communications infrastructure in NRW, promoting the establishment and growth of firms specializing in communications technology, and supporting the application of modern telecommunications technology in all branches of the economy. Teletech NRW is to serve as a catalyst in accelerating this development.

This Land-sponsored program was initiated in 1988 with a study phase. After the successful conclusion of the study phase at the end of 1988, Teletech NRW entered its current transition phase. The NRW Minister for Economics, Small Business, and Technology has delegated to the Nonresident University of Hagen, represented by Prof. Dr. Eng. F. Kaderali, the coordination of the program. The task of the Coordinating Committee is to stimulate the implementation of communications technology proposals.

In the first half of the allotted three-year time frame for the Land-sponsored initiative, more projects have been submitted than had originally been anticipated. At the beginning of the transition phase, the project Coordinating Committee was approached with 38 project proposals, of which over half were only rough drafts. Currently Teletech NRW is reviewing twice that number of project proposals. Today, approximately 45 project proposals are being actively pursued.

Teletech NRW is fulfilling its objective by using a wide range of concrete promotional techniques. Project proposals are evaluated on the basis of their technical and economic feasibility. The project partners, wherever necessary, are given advice regarding the formation and execution of project proposals. Many of the project proposals, thanks to the consultants' expert advice, were improved and brought closer to economic and technical reality.

To convert a project idea into reality, it is necessary to have access to a considerable number of cooperation partners from various fields. Teletech plays an active role in providing suitable contacts, and in many instances was able to get the necessary cooperation partners together at the same table. To accomplish this, the Coordinating Committee compiled a data base into which the project proposals were entered along with any relevant data. Moreover, Teletech NRW counseled the project participants on the available financial incentives for realizing a project idea. The services offered by Teletech are provided at no cost and without obligation to the project participants and, upon request, are provided on a strictly confidential basis.

Teletech NRW is promoting project initiatives in the four following areas: application, development, training and continued education, wideband communications, and studies. The spectrum of applications projects encompasses the business and administrative use of ISDN [Integrated Services Digital Network], applications for the exchange of business data based on standards (Edifact), the use of the Termex-Service (provided by DBP Telekom) in various fields, and the installation of a mobile wireless data transmission system (provided by DPB Telekom). Teletech NRW is actively engaged in promoting 16 projects in this area.

The projects dealing with development promote innovative initiatives aimed at communications technology. The original eight project outlines suggested during the Teletech NRW study phase have grown to a total of 16 actively pursued projects. Among these are various development projects involving X.25-Networks, ISDN, local networks, and terminal systems. Several projects dealing with training and continued education were placed into a separate group. These projects deal not only with promoting training in the field of communications, but also with employing modern communications technology in education and continued education.

In the category designated for wideband projects, all of the projects have been combined under the general heading of highly innovative wideband communications. Currently, Teletech NRW is actively pursuing eight wideband projects. A focal point for these activities is formed by the Media Park, Cologne, which is designed to serve as a center for the innovative application of telecommunications in various fields, such as the media business, continuing education, and the arts. In addition, Teletech NRW is promoting some studies, including the following: "Techniques for Computer Security in Open, Digital Telecommunications Networks," "Use of ISDN With the Aid of AC-Adapter Cards," and "Opportunities and Risks for Small Businesses in NRW in the Field of Radio and Satellite Communications."

Interested parties may request further information from the Coordinating Committee, which is continuing its work.

ITALY

Telecommunications Developments Reported

Research Project

91MI0050A Milan ITALIA OGGI in Italian 30 Oct 90
p 41

[Text] A videotelephone system that will use the innovative ISDN (Integrated Services Digital Network) telecommunications network will soon be tested in Italy and Europe. It is expected to have 30,000 users by 1993. This was discussed yesterday at a press conference in Rome at the opening of the "Broadband Networks and Telecommunications Services" conference during which the first results of the CNR's (National Research Council) targeted telecommunications project will be illustrated.

The five-year project was launched a year ago with an overall investment of 78 billion lire. The project director, Aldo Roveris, stated that apart from the CNR and universities, national industries will also play an important role in the development of systems, terminals, and innovative experimental networks. In fact, the approximately 41 billion lire in funding for the first three years will be divided among the CNR (4 billion lire), universities (9 billion lire), and companies (28 billion lire). The most advanced goal of the targeted telecommunications project, which is subdivided into five projects and includes more than 100 work groups, is to develop a broadband ISDN network that is much more powerful and flexible than the one to be experimented at the end of the year with 2,000 "friendly" users.

Broadband ISDN will permit voice, data, and moving or still high definition images to travel on a single infrastructure, as opposed to what happens today where each signal requires a specific network. This system, which will be tested early in 1995, is based on a so-called ATM (antitransit-receive) network that will divide the signals according to category and "envelope" them, specifying

what they are and where they have to go, and will then send them to their destination. This highly advanced technology, which is being studied in other industrialized countries as well, will permit high definition images to be sent at relatively low speeds, in other words only 40-100 million bits per second, instead of the billion bits per second that current techniques require.

Giulio Modena, head of a subproject, emphasized that CNR's research is based on international standards and also provides for the development of terminals (personal computer-televisions) capable of optimizing the multi-media services that the network will offer. Furthermore, the targeted telecommunications project includes an experiment on a "metropolitan network" that can offer advanced services to an Italian scientific community, which has yet to be selected, by sending voice and data on normal telephone loops.

High Definition Television

91MI0050B Milan ITALIA OGGI in Italian 30 Oct 90 p 41-42

[Interview with Massimo Fichera, deputy general manager of new technologies for RAI [Italian Broadcasting Corporation]; place and date not given]

[Text] The first high definition television sets will enter Italian homes within the next five years. This was confirmed by RAI's [Italian Broadcasting Corporation] deputy general manager of new technologies, Massimo Fichera.

[ITALIA OGGI] When will the experimental phase begin?

[Fichera] In 1992. The Olympic games in Barcelona will provide an opportunity. By that time we will have installed at least a thousand listening points across Italy.

[ITALIA OGGI] When will high definition be marketed?

[Fichera] The date remains that set in Paris a year ago: early 1995. Europe and Italy will try to catch up in a hurry. In fact, we are very far behind Japan which opted for a different system and has already started to broadcast in HDTV (high definition television).

[ITALIA OGGI] Which European country will be the first to have high definition?

[Fichera] I do not think there will at first. High definition will come to all of Europe at the same time. On the other hand, we have been collaborating on this for several years now.

[ITALIA OGGI] Which organizations will be responsible for promoting high definition?

[Fichera] CISAE (Italian Consortium for High Definition) was established in Italy a year ago and then became part of EUREKA [European Research Coordination Agency] as an A category partner. The project is funded by the EEC. A European economic group called "Vision

1250" has also been established. It is composed of nine European broadcasting companies and the UER (European Broadcasting Union) and its goal is to promote high definition products.

High definition television will be broadcast via satellite. RAI has already entered the sector with its Raisat channel, located on the Olympus satellite. In addition, the SARIT [expansion not given] program for the first entirely Italian telecommunications satellite is scheduled to begin in 1992.

SARIT will have five television channels and will be managed by a public-private company in Milan. The five channels will be assigned by the government, as is the case for radio and television frequencies.

However, I believe that high definition is something very different and that the costs of reconverting the entire television system, both in terms of broadcasting and receiving equipment, would be so exorbitant that no one would be willing to pay for the time being, especially in America. High definition is a multimedia system and we are explorers venturing into the unknown world of "image making."

[ITALIA OGGI] What are the reasons for using different systems?

[Fichera] The only reason why we at Rebo studios chose the 1125 line Japanese system is because it is the only one actually available, and really competitive at the level of commercial production. In my opinion the EUREKA project is still very far behind both in terms of the quality of the images obtained and its technology. I believe that RAI in Italy is wise to experiment with both standards since it has the budget to do this. However, we need to produce films that are not just interesting but also actually "on the market."

The reasons behind the two systems can be found in industrial requirements rather than art. The hardware industry encourages separate markets ... at this point, Europeans have preferred to develop their own industry as an alternative to Japan's. There is a strong pressure from groups to break up any eventual monopoly from Japanese corporations. I hope that we will agree on a single software production system. This is probably the only way to combine the systems.

The value of the acquisitions that Sony succeeded in making or "that it was permitted to make" as some people say, is independent of the developing HDTV market. I believe that Sony, which has now gone to Hollywood, will have many more problems than expected. In my opinion the 28,000 films that it now has in the bookstores may be a decisive factor in the future of high definition.

[ITALIA OGGI] What are the advantages of using high definition?

[Fichera] It is not easy to say whether any economic advantages exist; prices always vary greatly and there are

different points of view to consider when cutting down costs. For example, even though costs are essentially the same as for movies, television broadcasters find the costs much higher than normal video productions. The interesting aspect of high definition is the creative one; the possibility of controlling images the very moment they are filmed, and being able to intervene directly to modify the filming. This is why high definition is definitely better than television and movies, apart from the speed of splicing and the ease with which special effects can be obtained.

If, however, we consider that the life span of a television program is about 10 years, and it has no special requirements, the choice to advise is still a 35 mm film. If the program has a shorter life span, then high definition offers an excellent quality and the possibility of being directly converted into any television standard desired for the time being. There is also the possibility of having a masters degree in HDTV in the future.

Telecom Satellite Launch Preparations Described

91M10146X Rome AIR PRESS in Italian 12 Dec 90
pp 3011-3013

[Text] Italsat, the ASI's (Italian Space Agency) national telecommunications satellite, will be launched the night of 15 January 1991 by an Ariane 4 carrier (flight 41, launcher 44L) from the Kourou space center in French Guyana together with the European telecommunications satellite Eutelsat IIB. Italsat was designed and developed by Selenia Spazio, an Alenia company of the IRI [Institute for the Reconstruction of Industry]-Finmeccanica group.

After having successfully completed its testing campaign (February-October 1990) at the Intespace center of Toulouse, Italsat was transferred to Kourou on 6 November 1990 where the launch preparations campaign began. Selenia Spazio will be directly responsible for this phase, which will involve about 50 of its technicians, under the supervision of the ASI. The phase will include operating tests and the final integration of the satellite, filling the tanks on board, placing the satellite on the Ariane 4 carrier, and final launch operations.

The final checks on the satellite and all the subsystems on board, and the integration of the solar panels and antennas began on 6 November and will be completed on 10 December. The extremely delicate three-day operation of loading the satellite's fuel tanks with the 915 kg of propellant required to put the satellite into orbit and maintain it there for more than five years will begin immediately after. Once these operations are completed, the satellite will be ready for final operations with the second satellite (Eutelsat IIB) and the Ariane 4 carrier. These activities will begin when the Kourou center reopens after the Christmas break at nine days to takeoff and will involve: placing Italsat in the upper part of Spelda, the structure located at the top of the third stage of the carrier which permits double takeoffs; attaching the thermal shields (- eight days); placing the second

satellite in the lower part of Spelda (- seven days); moving the two satellites to the takeoff area (- six days); placing the Spelda structure containing the two satellites in the carrier. At this point the satellite will be connected by an umbilical cord for fueling, and via radio to monitor the state of the equipment by telemetry (- five days).

The final activities on the two satellites and carrier will include the following operations: the final preparation of the carrier; charging Italsat's batteries (- four days); a general test of the final countdown (- three days); final operations on the carrier and continued charging of Italsat's batteries (- two days); filling the first and second stages of the carrier and the continued charging of Italsat's batteries (- one day).

The final operations will begin on the day of the launch (at - 12 hours to takeoff) and include: final checks on the two satellites and the carrier, filling the third stage of the carrier (at - three hours 35 minutes), placing the two satellites in a launch configuration (- one hour eight minutes). The final automatic sequence of operations will begin at - six minutes and includes checking all the systems to switch the satellites over to internal power; transferring the carrier's instruments to internal power (- one minute); opening the inertial exchange [centrale inerziale] (at - nine seconds), and the cryogenic arm aperture command (at - four seconds); and the ignition of the carrier's first stage (at - two seconds to takeoff).

In parallel with the activities in Kourou, operations are being finalized to manage the very first phase of the satellite's orbit and its positioning in space (13 degrees E): orbital maneuvers, spreading the solar panels, engine ignition. These operations will be carried out by ESOC (the European Space Agency's control center in Darmstadt, Germany) with the participation of Selenia Spazio's project group and under ASI's supervision. Selenia Spazio has specified the requirements for all the scheduled phases of the satellite's orbital mission.

Italsat is the first all-Italian telecommunications satellite. Of extremely advanced design, it operates at high frequencies (20/30 GHz) using digital technology. On Earth, control and connecting stations will handle part of the national telephone traffic. Thanks to Italsat it will be possible to increase the flexibility and operations of the national networks with which it will be integrated. Its on-board switching functions, which makes it an authentic telephone center in space, will permit telephone lines to be assigned according to need. It will use 20-30 GHz digital telephony with multibeam national coverage and a 1,200 telephone circuit capacity to create a more flexible national telephone network, and will provide nationwide consumer services (experimental videoconferences, newspaper transmission, high speed connections between calculators, emergency connections) at 20/30 GHz. In addition, propagation experiments are anticipated at 40/50 GHz for future European-wide telecommunications systems.

Selenia Spazio was the prime contractor for the Italsat program. It was responsible for designing, developing, constructing, and testing the satellite and the three telecommunications missions, the connecting and controlling stations on Earth, and the Earth-to-space telecommunications system. The value of the basic contract between ASI and Selenia Spazio amounted to 410 billion lire for the construction of the satellite and 136 billion lire for the construction of the Earth stations. The total value of the space-Earth contracts amounted to 546 billion lire. Selenia Spazio's share for the satellite was 251.5 billion lire, amounting to 58 percent of the total value and its share for the Earth stations was 102 billion lire amounting to 75 percent of the total. The overall value of Selenia Spazio's participation therefore amounted to 353.5 billion lire.

Selenia Spazio has already started on the second Italsat F2 satellite which will be completed and delivered in August 1993. Once Italsat F2 is in orbit the experimental digital telephone system will become operational after being integrated into the SIP [Italian Telephone Company] telephone network.

In the future, Selenia Spazio will be able to exploit the experience acquired in this program in other national and European telecommunications programs. In particular, the Italsat satellite's platform will be used at national level for SARIT, the direct television broadcasting satellite, and for SICRAL the telecommunications satellite used for civil defense. The platform will be used at the European level for the ARTEMIS [Research Workshop for Systems Mathematics and Data Processing Systems] telecommunications satellite and for the DRS (Data Relay Satellites) satellites. Selenia Spazio is the prime contractor for these programs.

PORUGAL

1991 Satellite Launching Studied

*91WT0106A Lisbon EXPRESSO in Portuguese
23 Feb 91 p A16*

[Article by Rui de Carvalho: "Military Use of Portuguese Satellite Possible"]

[Text] Portugal may have a satellite in orbit by 1993 if enterprises interested in establishing a consortium to finance the project can be found. Both private enterprises and public bodies will be welcome to participate, and there are indications that simultaneous civilian and military uses are being contemplated.

The initial plan was drafted by LNETI [National Industrial Engineering and Technology Laboratory]. The plan's mentor was Prof. Carvalho Rodrigues, and the proposal was presented Monday at a meeting sponsored by Minister of Industry and Energy Mira Amaral, with various businessmen in the telecommunications and service sectors, as well as the Ministry of Defense.

According to this plan, a satellite weighing about 45 kg will be placed in orbit at an inclination of 63° and an altitude of 1,300 km. As a result, the projected trajectory of the apparatus will pass over Reykjavik, Iceland, along the Portuguese coast, more or less over the point where the Moroccan, Algerian, and Mauritanian frontiers meet, and then over Sao Tome and Principe, and off the coasts of Zaire, Angola, and Namibia. A complete revolution will take about an hour and a half.

As explained at the meeting, the idea would be to use the satellite for remote-sensing operations, environmental control, and communications among the Portuguese-speaking African countries. In fact, it has been learned that LNETI is already a participant in the Geometrical consortium, which was represented at the meeting, and has devoted itself to survey work, agricultural in particular, based on images obtained from the French SPOT [Earth Observation Test System] satellite.

Possible Military Use

The presence of representatives of the Ministry of Defense led to the belief that the use of satellite images for military purposes is also intended.

The use of the satellite as a communications platform appears less likely, however, in view of the altitude planned. As is known, there are two basic types of satellites—those at low altitudes and those at medium altitudes, like the one that has now been proposed. They are generally used for remote sensing. Then there are the so-called geostationary satellites, which are preferred for communications. Satellites of this type are placed at an altitude of about 36,000 km, so that they can move at a speed equal to that of the rotation of the earth. In this way, they remain constantly over the same point on the earth's surface, appearing stationary—hence, their name. This feature enables them to cover a large area of the planet, making communications among various points possible.

The proposed satellite, for its part, will pass over each point at 95-minute intervals, and, given its low altitude, its range will be very limited. Even the use of the method of storing data for later transmission, included within the plan under the English term "store forward," is of limited interest. In fact, this satellite is not useful for telephone communications, as is thought to have been suggested, but can nonetheless be used for the transmission of radio or television programs.

In the remote-sensing sector, on the other hand, the usefulness of this type of satellite is equally debatable, in view of the price charged for the images of the French and U.S. satellites. More complete coverage of the national territory and the Portuguese-speaking countries can, however, be contemplated. The main interest may lie here in the future, if prospects for requests from the African countries for remote-sensing studies develop.

UNITED KINGDOM

Satellite Research Center Opens in Surrey

91WT0105A London THE DAILY TELEGRAPH
in English 2 Feb 91 p 11

[Article by Christine McGourty: "Satellites May Raise the Tone of Phones"]

[Text] An international centre for satellite research that could bring cheap mobile phones which provide high quality links anywhere in the world has been established at the University of Surrey.

The 2 million pounds [£] Centre of Satellite Engineering Research is the first of its kind in Europe, said Prof Barry Evans, its director.

One of the aims is to improve portable telephone systems by linking them with a constellation of small satellites. This could allow international telephone calls which are "quicker, of better quality and cheaper," said Prof Evans.

It depends on the development of a new generation of microsatellites which orbit between 300 miles and 900 miles from Earth, and cost between £250,000 and £500,000.

Conventional satellites orbit about 23,000 miles above Earth and cost about £50 million.

"Until now it hasn't been possible to use microsatellites because of the cost of launching them into orbit and

because the systems for controlling them are horrendously complex," said Prof Evans. "Both of these things have now become less of a problem."

He says a system in which a group of satellites is linked to portable telephones on the ground could be in place by the end of the century.

Using low orbiting satellites could bring an end to the irritating voice echoing which often occurs in long distance calls because of the delay as the signal travels between stations on the ground and the satellite.

By using a group of satellites, the chances of communications being blocked in urban areas because of tall buildings would be reduced.

Linking cellular phones to a satellite system would also make it much easier to track people as they move about and could link up the range of different systems now operating.

"There's a plethora of portable systems at the moment and we're looking to how satellites could integrate them," Prof Evans said.

The centre will employ 100 scientists on a range of projects including spacecraft engineering, satellite communications, materials for space, computing and robotics. It will also be used for education.

The university's fifth and newest satellite, called UoSAT-F, to be launched in May 1991, will act as "a postman in the sky," Prof Evans said, testing a new system for storing messages for delivery later when the satellite reaches the correct position.

NTIS
ATTN: PROCESS 103
5285 PORT ROYAL RD
SPRINGFIELD, VA

22161

This is a U.S. Government publication. Its contents in no way represent the policies, views, or attitudes of the U.S. Government. Users of this publication may cite FBIS or JPRS provided they do so in a manner clearly identifying them as the secondary source.

Foreign Broadcast Information Service (FBIS) and Joint Publications Research Service (JPRS) publications contain political, military, economic, environmental, and sociological news, commentary, and other information, as well as scientific and technical data and reports. All information has been obtained from foreign radio and television broadcasts, news agency transmissions, newspapers, books, and periodicals. Items generally are processed from the first or best available sources. It should not be inferred that they have been disseminated only in the medium, in the language, or to the area indicated. Items from foreign language sources are translated; those from English-language sources are transcribed. Except for excluding certain diacritics, FBIS renders personal and place-names in accordance with the romanization systems approved for U.S. Government publications by the U.S. Board of Geographic Names.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by FBIS/JPRS. Processing indicators such as [Text] or [Excerpts] in the first line of each item indicate how the information was processed from the original. Unfamiliar names rendered phonetically are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear from the original source but have been supplied as appropriate to the context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by the source. Passages in boldface or italics are as published.

SUBSCRIPTION/PROCUREMENT INFORMATION

The FBIS DAILY REPORT contains current news and information and is published Monday through Friday in eight volumes: China, East Europe, Soviet Union, East Asia, Near East & South Asia, Sub-Saharan Africa, Latin America, and West Europe. Supplements to the DAILY REPORTS may also be available periodically and will be distributed to regular DAILY REPORT subscribers. JPRS publications, which include approximately 50 regional, worldwide, and topical reports, generally contain less time-sensitive information and are published periodically.

Current DAILY REPORTS and JPRS publications are listed in *Government Reports Announcements* issued semimonthly by the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, Virginia 22161 and the *Monthly Catalog of U.S. Government Publications* issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

The public may subscribe to either hardcover or microfiche versions of the DAILY REPORTS and JPRS publications through NTIS at the above address or by calling (703) 487-4630. Subscription rates will be

provided by NTIS upon request. Subscriptions are available outside the United States from NTIS or appointed foreign dealers. New subscribers should expect a 30-day delay in receipt of the first issue.

U.S. Government offices may obtain subscriptions to the DAILY REPORTS or JPRS publications (hardcover or microfiche) at no charge through their sponsoring organizations. For additional information or assistance, call FBIS, (202) 338-6735, or write to P.O. Box 2604, Washington, D.C. 20013. Department of Defense consumers are required to submit requests through appropriate command validation channels to DIA, RTS-2C, Washington, D.C. 20301. (Telephone: (202) 373-3771, Autovon: 243-3771.)

Back issues or single copies of the DAILY REPORTS and JPRS publications are not available. Both the DAILY REPORTS and the JPRS publications are on file for public reference at the Library of Congress and at many Federal Depository Libraries. Reference copies may also be seen at many public and university libraries throughout the United States.